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Land & People OF THE ANDAMANS

(A Geographical & Socio-Economical Study with a short account of the Nicobar Islands.)

BY

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[Introductory, p. i]

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FOREWORD

Shri Probhat Kumar Sen, M.Sc. has brought out an interesting monograph on the Land and People of the Andamans based on his field work for a number of years. As a post-graduate student Shri Sen selected this area for geographical study and prepared a thesis for his Master's degree. This appears to be the revised and detailed version of his thesis. The Andaman and Nicobar islands are in the Bay of Bengal, and prove to be an ideal spot for rehabilitating surplus population of India, provided it is done on a planned basis, keeping an eye to the potential wealth of the islands specially in its virgin forests. Shri Sen has referred to the salient features of the regional geography of the islands and traced the growth of population in these islands since the eighties of the last century.

I hope that this important treatise will focus the attention of all concerned to this relatively unknown underdeveloped islands, which have immense possibility of playing an important role in the economy of India.

Dept. of Geography
Calcutta University
11th May, 1962

S. P. CHATTERJEE

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[Introductory, P. iV]
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PREFACE

The dearth of literature but considerable curiosity about the islands because of the presence of the aborigines, the development of the penal colony and in recent years the colonisation of the refugees, have inspired the author to write a geographical treatise of these islands covering almost all their physical and socio-economic aspects. The interest of the author about these islands of course dates back to some 8 or 9 years for preparing a thesis about these islands as a part fulfilment of his M. Sc. course and the author with the limited time and money made some personal enquiries for the collection of data and the assessment of the situation. The access to the data and the other research materials and the visits to the different parts of the islands were possible through the kind permission and help of the-then Chief Commissioner Sri S. N. Maitra, the Forest Officers, the Head Master of Port Blair High School. Dr. L. Cipriani besides a host of other officers and friends in the islands and also at Calcutta. However the ultimate preparation of the thesis became possible for the kind guidance of Dr. S. P. Chatterjee, Head of the Dept of Geography, Calcutta University.

Anybody faces a tremendous problem in conducting a thorough survey of the islands arising out of the poor communication facilities both on land and water, and more so on account of the very few literatures on the islands. The author cannot demand a thorough enquiry in all parts of the islands and his analysis of the different aspects has been derived more from the conclusions of sample survey.

Though a long time has elapsed since the preparation of the thesis in the year 1955, the author has been, on the whole, eager to incorporate all the latest informations of the islands. The present book is partially a reproduction of his previous thesis with some additional facts and informations and the objective of such changes has been to prepare a comprehensive geographical treatise rather than focussing one particular aspect as was done in the thesis i.e. the colonisation problems of the islands. Besides this, additional chapters on the aboriginal population, the overall assessment and also a geographical account on the Nicobar Islands have been added. The Nicobar Islands, though form only a sidelight of the book, also command a separate geographical treat-

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128 ment because of the altogether different character of the islands. In spite of such a distinctness in the geographic personality of the Nicobar Islands, only an introducing chapter has been given.

Never the islands with an area of 2508 square miles and with no fabulous wealth can be a land of Aladin's Lamp but the multiplicity of interest of the islands make them extremely interesting.

The book is published with the idea of providing a reference on all aspects of the islands, not only for the general readers but also for the research workers. If this book serves a little in removing the dismal obscurities of the islands by way of serving as a ready reference of the islands, the author will no doubt feel complacent.

Academic help and advice have been obtained from a large number of persons. For the preparation of the study on the aboriginal population, the author owes his debt of gratitude to Professor Nirmal Kumar Bose and Dr. S. S. Sarkar who have so kindly rendered their valuable help and guidance in this connection. Many of the photographs have so kindly been given by A. S. I. for incorporation within the book. The help, co-operation and suggestions have been derived from such a large number of persons that the author owes a tremendous debt of gratitude to all of them. Last but not the least, the author extends his sincere thanks to Sri G. R. Bhattacharyya for undertaking the pains of this arduous task of publication which has been continuing for a fairly long time.

PROBHAT KUMAR SEN

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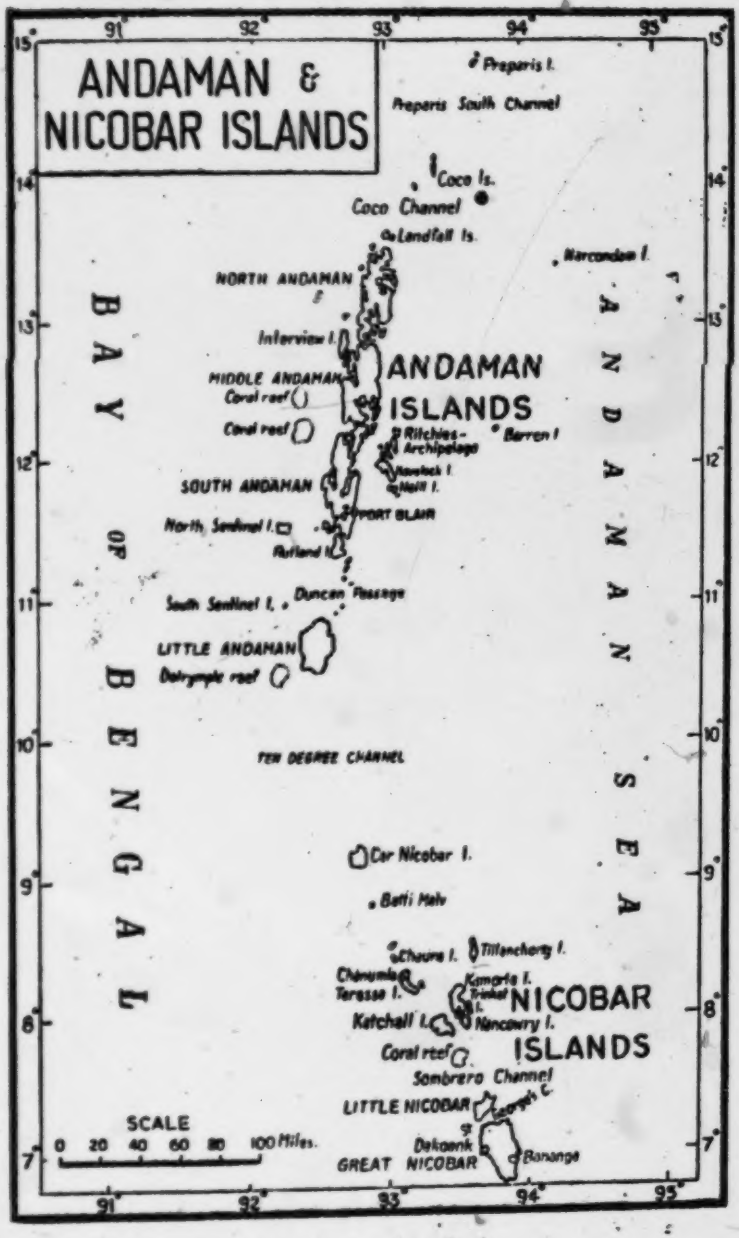

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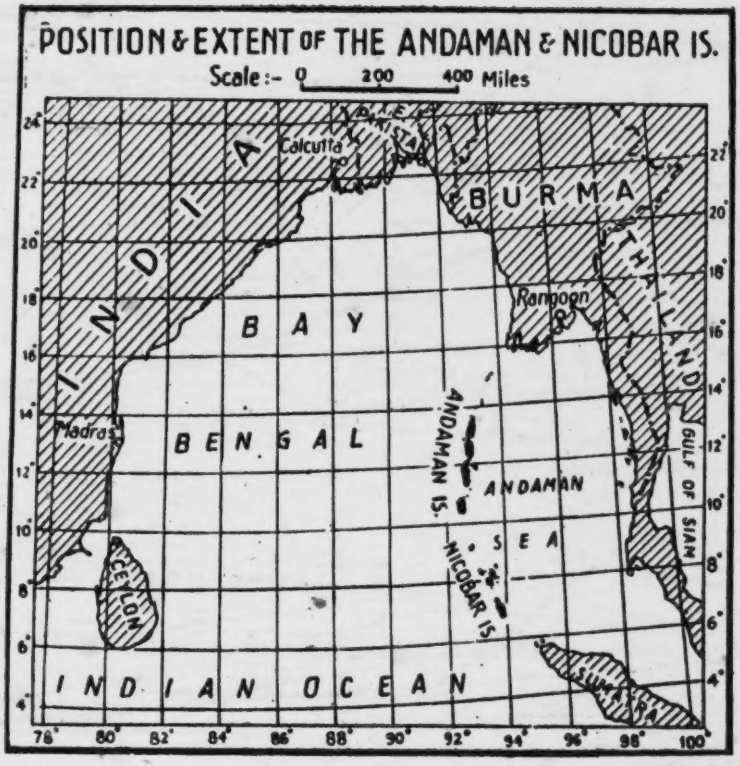

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INTRODUCTION

A group of north-south running islands as they are, the Andaman Islands have as many as 204 small islands where the impact of civilisation and growth has been little and the human history has been one of stagnation rather than of chequered career. Being a land of aborigines, the foreign intrusion has been quite feeble though mention about these islands is found in the early records of the travellers. Though the knowledge about the islands is derived from the notes which date back to 2nd Century A.D., the contacts with the foreigners have been all the time transient and extremely feeble. Before the formation of the penal settlement, the islands have been known as an island of horror because of the presence of such tribal people who would eat up the man they encounter and as regards the wealth there has been imaginary illusion, sometimes being called as the Island of Gold. The historical record of the islands which can be built with a fair degree of precision is since the formation of the penal settlement. There has been the search for resources as well as their exploitation. However, all the attempts for finding minerals and the geological explorations have shown the possibility of the existence of some poor quality coal, copper etc. Virtually there has been a conspicuous lack of efforts for the development of the islands. The penal settlement which grew up in Port Blair did not have any considerable influence on the overall development of the islands. Nevertheless with the more intimate knowledge about the islands, the forest exploitation had increased and the land around Port Blair was cleared for agriculture. The little amount of agriculture that was started and fostered by the local-borns in and around Port Blair never expanded considerably and it remained confined to a few areas of South Andaman only. The aborigines were very much widespread and in the beginning they had exercised hostility and arrogance which had in course of time given place to a very friendly and amicable terms with some of the tribal groups i.e. the Onges and the Andamanese. The Jarawas, however, still now maintain their hostility and the attempts for bringing them under amicable terms have so long proved futile.

Nothing more deserves a special note in the islands than the aboriginal population. Because of the insular nature of the islands, the aboriginal population is considered to be one of the purest type though the foreign intrusion has brought about an extremely rapid impoverishment and decay only during the last few decades of contact with these aborigines.

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161 177 182 Of the two main groups of aborigines, the Great Andaman Group and the Little Andaman Group, the former being the most widespread and numerous in the Great Andamans has become completely non-existent depicting the example of the decay within an extremely short time, especially since the impact of the foreign people. The fate of the later group is also quite shattering—the Jarawas have experienced both numerical decay and territorial shrinkage and the Onges are the only tribes who live exclusively in the Little Andaman but they have been also facing the signs of decay.

133 A glance at the map of the Andaman islands and adjacent countries shows the continuity of these islands with the Arakan Yoma of Burma in the north and with the Indonesian islands in the south. The islands of both the Andaman and Nicobar groups are primarily of sedimentary formations of the Eccene period with occasional igneous intrusions. Later formations of coral are also quite widespread. The surface topography of the regions is typically flat-topped being typical of the sandstone regions and the peaks are in most cases formed of igneous intrusions. The islands are comprised of a number of longitudinal ranges running from the north to the south and in between the ranges short streams flow. The heights of the hills are generally 1000′ and never exceed 2500′.

132 The islands experience a high annual temperature and the yearly rainfall is as high as 130 inches in Port Blair and the amount decreases as one moves to the north and the east. The ameliorating influence of the sea is quite appreciable.

131 With an area of 2508 square miles and the number of islands being as many as 204, only 4 main islands, North Andaman (490.20 sq miles), Middle Andaman (561.00 sq miles), South Andaman (359.51 sq miles) and Little Andaman (289.90 sq miles) have an area of more than 100 sq miles and the rest are sufficiently small in size either to command human settlement or economic activity.

101 The economy of the tribal people is of the primitive form of hunting and collecting though the precise modes of living vary to some extent depending upon the nature of environment under which they have to live. The knowledge of distribution and of actual number of these aborigines is far from accurate. The Andamanese were the most widespread in all parts of the Great Andamans and in the South Andaman they (Aka bea) had to remain vigilant against the possible attacks and territorial expansion of the Jarawas. The Andamanese, as said earlier, have completely died out. The Jarawas, though have dwindled to a negligible number,

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have been pushed into the western jungle infested areas of South Andaman by the foreign settlers and even now attempts of establishing contacts and maintaining good will have proved completely futile. The Onges at present, inhabit the island of Little Andaman, 40 miles from South Andaman and they have come under very negotiable and friendly terms. A detailed account of these aboriginal population has been given in a chapter on the aboriginal population.

Leaving aside the aboriginal population, the islands are being inhabited by the local-borns or the Andaman Indians who have settled in and around the urban centre of Port Blair. The convicts of the penal settlement have settled in these areas by bringing their family members from the mainland or by getting married with the convict women and to-day they are the Andaman Indians. The Andaman Indians drawn from different parts of India and having different languages have become an integrated homogeneous community with Hindi as their spoken language and Urdu as their written script. Such a formation of homogeneous community is verily an example of fusion of different groups under a geographical setting with a common economic and social background. These people shared the major merit of development of the islands. Though agricultural development was attempted, it remained confined to a few areas only. The Andaman Indians being mostly non-agriculturists have shown a reluctance to agricultural practices which is evident from the gradual inflow of these people from agricultural to non-agricultural pursuits, especially in the Government services. The absence of any genuine attempt, to a great extent because of the lack of Government help, has told immensely on the relatively poor development of agriculture. These people are getting fairly educated at Schools in Port Blair and have the collegiate education in the mainland. The educational attainments have, however, been quite upto the satisfaction of meeting the demands of the institutions at Port Blair and in the islands.

Apart from the aboriginal population, a few groups of Bhantus and Mapillas, two criminal tribes of India, and a few Burmans and Karens have settled in the islands. Excepting the Karens who have settled through free enterprise in the north of Middle Andaman, all the groups were brought to the islands to serve the terms of their conviction. However, all these groups have settled quite peacefully in the islands with agriculture as their basis of economy. A limited number of people come to the islands for serving in the administration but they have no interest to settle in the islands and even to-day, the service in the Govt. offices

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563 is made lucrative by way of giving an additional allowance of 33.3% to the basic salary in the islands. The lack of social and cultural developments coupled with the remoteness of these islands still now provoke this apathy. Since the independence, the colonisation of the uprooted East Bengal refugees together with some people from South India is being implemented. An appraisal of the resources of the islands shows the possibility of the development of agriculture with rice as the staple crop, as is common to tropics and on account of the hilly terrain and the vegetative cover, the area of the agricultural development is not at all considerable but quite sufficient for 5000 families. Of all the three main islands, the North, Middle and South Andamans, Middle Andaman offers the maximum potentiality by virtue of the bigger area, presence of a number of river valleys and absence of any other settlement of the later settlers or aborigines. Next to it is the North Andaman and lastly the South Andaman though it seems to be the most lucrative of all the islands. The response of the refugees in the beginning of the implementation of such a programme has been poor which largely owes to the lack of knowledge about the islands, the long distance from the mainland and also due to their being a land of aborigines and penal settlement. However the improved knowledge and the personal acquaintance with the islands have proved a long way in dispelling those aweful ideas. A new chapter in the history of the islands has opened for such enterprises which aims at an all-round regional development simultaneously with the agricultural settlement.

563 F648 For such a small group of islands the cultural diversity is quite conspicuous arising out of the settlement of a heterogeneous group of people coming from different parts of India and also of some from Burma. Though circumstances have played a great role in bringing about a homogeneity, a precise observation shows their distinct characteristics. The aboriginal population has, however, become an object of academic study only and the few of them, the Jarawas, the Onges and the Sentinelese, who are surviving need a deeper intimacy with the civilised people but so far except the Onges such efforts have not proved successful. The penal settlement which ultimately gave way to the development of settlement in South Andaman did not prove very envigorating for the lack of Government help, co-operation and imbalanced sex-ratio. The demographic characteristics have been dealt in details in the chapter on the later settlers and show how much imbalanced it is for the successful growth of population. However the agricultural settlement of the refugees obviously paves the way for a healthy development of the population and

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simultaneously with it a successful all-round regional development of the islands.

The resources of the islands having a small areal extent are very limited though the forest and sea products are fairly rich to deserve special mention. The presence of a variety of valuable species of timber in these islands has led to their exploitation since the development of the Penal settlement. The important species of timber found in the Andaman forests are padauk, garjan etc. In the previous decades, the forest exploitation was never associated with a commensurate amount of forest regeneration. Such policies are being followed at present for saving the forest resources from ruthless exploitation without any adequate means of ensuring a perennial supply of timber by systematic regeneration. The recent colonisation scheme has invoked the enquiry for the clearance of the forests. Andaman forests being rich in timber and also being the only major revenue earning source of the islands should by no means be ruthlessly cleared for settlement. Not only it depletes the forest resources but also degenerates the soil—the soil erosion being the immediate victim after such clearance of forests. Considering the primary importance of the forest resources of the islands, it seems to be a plausible agreement that at least 50% of the land should be reserved under forest cover and a further curtailment from this percentage will undoubtedly lead to serious consequences of the soil simultaneously with a great decrease in the resources of the islands.

The sea products range from a wide variety of products from sea shells to sea fisheries. The collection of sea shells is in vogue from a fairly long time and the sea fisheries, mostly being confined to the coastal areas, is conducted by the fishermen and the tribal people for their own consumption. There is a good deal of possibility for furthering the development of marine fisheries on a commercial scale but the lack of enterprise and capital investment has not given rise to any appreciable development. The only two enterprises of the fisheries are those of Trochus and Turbo shells by the Japanese during 1930-36 and another enterprise by a business concern in 1947. Even the present catch from the coastal areas amount to only 300 lbs., a considerable lag from the demand within the islands.

The means of earning livelihood in the islands were hunting and collecting by the aboriginal population who have not even to-day learnt the techniques of domesticating plants and also animals except the Onges who have domesticated the dogs very recently. The penal settlement and the subsequent expansion of the administrative seat at Port Blair

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gave way to the development of agriculture over an extremely limited area in South Andaman — paddy cultivation and coconut plantations have succeeded quite well. The plantations of rubber, tea and coffee also developed in the South Andaman over very small areas but ultimately did not prove very successful, partially due to the lack of adequate care. Simultaneously with the settlement of the refugees, new areas are being brought under plough which had never been interfered with human hands. The growth of agriculture based on rice cultivation together with vegetable gardening, development of orchards, coconut cultivation will bring about self-sufficiency of the islands and make the people self-supporting.

Industrial development of any big scale cannot be foreseen except the lumbering industry because of the lack of resources, power and also of any appreciable home market. Besides lumbering, the fishing industry, if properly co-ordinated with the mainland, can be developed to a great extent. A number of cottage industries based on coconuts, sea and forest products have developed, of which the coirmaking has developed most.

The characteristics, common to the tropical islands, are to a large degree manifested in these islands. The physical environment suffers from a number of limitations. Hot and humid climate is ameliorated by the influence of the sea in all parts as none of them are more than 10 miles away from the sea. The problems of soil are quite tremendous and such signs are only discernible to a small extent in the islands which might share greater proportions in the future if adequate measures of careful cultivation are not undertaken. The natural vegetation should be carefully preserved and regenerated after the felling of the trees not only for the conservation of the vegetation but also for saving the soil from the serious consequences of erosion. The cultural environment is a mosaic of variety because of the different types of people who have been living in these islands, however negligible their number might be. The imbalance of regional growth, being exclusively confined to the South Andaman, is being removed with the growth of settlement in the other parts of the islands and the indications of the shift in gravity of the economic interests is synchronising with the progress of settlement in the North and Middle Andamans. Mayabunder is handling a greater share in the movement of commodities and passengers. Such changes are undoubtedly very much welcome as the lowering of the disparities in the regional economy and growth speak of an all-round regional development.

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The Nicobar group of islands being separated off from the Andaman Islands by the Ten Degree Channel, though constitute a part of the continuation of the island in the north, the geographical enity of these islands are conspicuously different from that of the others. The Nicobar Islands have an area of 635 sq. miles and have 19 islands, out of which 12 islands are inhabited. The human habitats are exceedingly interesting and these people are distinctly different from the aborigines of the Andamans not only in their physical characteristics but also in their cultural attributes. Material life is much more improved and they have been all the time experiencing a healthy growth in comparison to the rapid decay of the Andaman aborigines. Culturally the affinity seems to be closer with the Indoncsian islands. Shom Pens, the highlanders of the Great Nicobar, live in perfect isolation and have an extremely primitive economy. The staple crop is coconut and a number of fruit trees and yam are also grown. Some of the islands have become extremely overcrowded and need immediate dispersal to some of the less crowded islands. A detailed geographical treatment would require much more words to say about these thriving people and their contact with the foreigners than those of the Andamans. However it remains incomplete if the study of the Nicobar Islands is not incorporated in that of the Andaman islands. Therefore, in spite of the distinct geographical contrast with the Andamans, a short geographical summary has been given at the end of the book.

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A Panoramic view of an island of the Andamans.

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PART I
PHYSICAL BACKGROUND

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CHAPTER I

POSITION AND EXTENT

The Andaman Islands, comprised of a large number of islands amounting to as much as 204, cover an area of 2508 square miles. These groups of islands with the other ones in the south, known as the Nicobar islands, are the only Indian islands in the southeastern ocean frontier. The alignment of the Andaman and Nicobar Islands is from the north to the south and these groups of islands have geological affinity with the adjacent countries i.e. Burma and Indonesia. These tropical islands possess some of the salient characteristics of the tropics given to the very primitive type of economy. |3|

The Andamans lie between 10°30′ and 13°30′ north latitudes; and between 92°15′ and 95°15′ east longitudes. The extreme length and width are 219 and 32 miles respectively. At the extreme north is the Landfall island followed by the three main islands of the Andamans—the North Andaman, the Middle Andaman and the South Andaman, all of them being separated off from each other by shallow seas. Further South at a distance of 40 miles from the South Andaman lies the Little Andaman. Besides these there are innumerable small islands—Ritchie's Archipelago and the Sentinel Islands may be worthy of mention.

There is an absence of unanimous agreement regarding the number of the islands and their respective areas. No one has, however, been able to locate all the islands on the map but the estimate made by the Forest Department is considered as the most authoritative.

Area of the islands in square miles.

Island	*Area*
North Andaman	490.20
Middle Andaman	561.00
South Andaman	359.51
Landfall and 7 other islands in the North Andaman Group	27.92
Interview and 4 other islands in the Middle Andaman Group	59.00
Baratang and 4 other islands in the Baratang Group	11.34

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Island				*Area*
Havelock and 6 other islands in the Ritchie's Archipelago Group	...	...	...	94.20
Rutland and 3 other islands in the South Andaman group of islands	...	...	...	73.86
Tarmughli and 4 other islands in the Labyrnth island	...	...	...	12.20
Little Andaman	...	...	...	289.90
166 other islands	...	...	...	430.97

But regarding the above statistics, Sri H. R. Shivdasani, I.C.S. writes as follows:—

'Obviously the area of 430.97 square miles for the other small islands is incorrect and far too much. It gives an average area of 2 square miles per island in which case they deserve individual mention when other islands of less than 1 square mile in area have come to special notice. Forest officers themselves admit that these 166 small islands cannot have a total area of 1430.97 square miles. We may assume that the information of the Punjab Delegation[1] is correct. Even so it would seem that if out of the other islands (735 square miles) we exclude Baratang, 90 square miles, and Little Andaman 290 square miles, there will be 200 small islands with a total area of 335 square miles'.[2]

The Andamans lie 590 miles from the Hooghly mouth, 120 miles from Cape Negrais of Burma and 340 miles from the northern extremity of Sumatra. In spite of the very close situation of the islands to the crowded countries like the mainland of India, Burma and the Indonesian countries, the contact has been quite feeble.

1 The Punjab Delegation went to the Andamans to explore the possibility of colonisation in the islands.

2 Shivdasani was sent to the Andamans with a party by the Government of India to study the aspect of colonisation in the islands in the year 1949.

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CHAPTER II
HISTORICAL BACKGROUND

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The insular position of the islands has made the Andaman groups of islands extremely obscure and even to-day the obscurity of the islands has not been totally dispelled. The islands being cut off from the rest of the world have remained as the abode of the negritoes until the very late arrival of the people from the civilised countries at the end of the 18th century. Though there were occasional incidents of plunder and raids by the pirates in the islands, no account of the chronological sequence of the facts and incidents can be built up except some erratic speculations gathered from the books written by the early traders. The isolation and the obscurity of the islands were removed to a considerable degree with the arrival of the British administrators and the consequent development of the penal colony. It is only after the formation of the penal colony that the historical account of the islands is made available. The history of the islands is extremely fascinating which depicts how the melting pot gave way to different people. It is only through the proper understanding of the historical background that the land and people of the islands hold up their true character, though in a treatise like this the study of history is beyond the direct compass. From the study of the history of the islands it can be concluded that geography has largely, if not wholly, determined the history of the islands. Geography, of course, is a study of different spaces (regions) but it is not a static one because of the great interaction of man with his land which gradually moulds it into different shapes and so it has got its reflection in history, a study of the different times.

The historical phases of the islands can be roughly grouped into four main periods which show some distinct tendencies separated off from each other.

1 Upto 1788—The period of seclusion and piratical disturbances.
2. 1788-1941 — The British regime—a period of foreign intrusion and settlement.
3 1942-1945 — The Japanese Regime.
4. Post Independence Period — Attempt of all-round regional development and welfare of the islands and the settlement of the refugees mainly from East Pakistan.

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175 (I) *The Period of Seclusion and Piratical Disturbances*

In this period of seclusion, people had some knowledge of these islands from the travellers, traders and sea-pirates owing to the central position of the islands on the trade routes of India, Burma and the Far East. The islands were inhabited exclusively by the aborigines. Mention of these islands dates back to the 2nd Century A. D. in the writings of Claude Ptolemy. The map referred to, in his writings, indicates the Islands of Buzacata to be in the place of the Andaman Islands and it is said that this island produces quantities of shells and the inhabitants go naked and are called Agmatae. It is believed that the Island of Buzacata means to refer to the Andaman Islands and such a peculiar name (Buzacata) has been achieved through the originality of the cartographer.

Later mentions of these islands are found in the collection of early Arab notes of the 9th Century on India and China which were translated by Eus. Renaudat and the people of the Andamans have been called Angamanians. Further mention of the islands is made by two Mohammedan travellers (Pemberton's General Collection of voyages and travels), Chinese Buddhist Monk I'Tsing (672 A.D.), Marco Polo (1286 A.D.), Friar Odoric (1322 A.D.), Nicolo Conti (1430) etc. From most of their writings it was evident that the islands were inhabited by very ugly brutes who would eat up any man whom they could lay hands on. Nevertheless, this was a land of riches and was named the "Island of Gold." An idea of the knowledge of these islands in the early days can be had from the notes of Marco Polo, a portion of which is quoted below.

"Angamanian is a very long island.. The people are without a king and are idolaters and no better than wild beasts. All the men of this island of Angamanian have heads like dogs, and teeth and eye likewise; in fact, in the face they are just like big mastiff dogs. They have a quantity of species; but they are a most cruel generation, and eat everybody that they can catch, if not of their own race. They live on flesh and rice and milk and have fruits different from any of ours."

[648] These types of early notes by different travellers are largely written from second hand knowledge and tales current in the neighbouring countries of the Andamans viz. Malaya, Siam, etc. Mr. Portman[1] opines

[113] 1 Portman, M. V.—A history of our relations with the Andamanese.

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that, "it should be remembered that it was to the interest of the pirates who made the Andamans a headquarters of their raids and also enslaved the aborigines, to exaggerate the real dangers they encountered and spread such tales regarding the Andamans as would keep them away." The islands have been ravaged by the Malay sea pirates from very early times. They used to come to collect shells and to carry on the slave-trade. These sea-pirates, through their exaggerated propeganda, made the islands a monopoly ground of their own and, in consequence, people used to know it as a land of horror. The slaves brought by the pirates used to find their way in the courts of Siam, Cambodia and Indo-China for many centuries, thus bringing about the deepest distrust and hostility on the part of the aborigines to all the visitors to the islands.

The name '*Andamans*' of the islands is a corrupt form of the name '*Hanuman*' or 'Monkey peoples', the aboriginal antagonists of the Aryan immigrants in India. In the earliest Hindu mythology, the *Ramayana*, these islands were believed to be a land of the *Hanumans*. Malayans used to refer to them as '*Handuman*' which is even a corrupt form of *Hanuman* and from Malay the knowledge about the Andamans first spread into the different parts of the world. Hence the '*Handuman*' has further evolved into '*Andaman*'.

(2) *The British Regime and the Period of Foreign Intrusion and Settlements Since 1788.*

Factual records of the history of the Andamans can only be had since 1877 with the steps taken by the British Government of India to found a penal colony in the islands. The disturbing activities of the Malay pirates and the frequent massacres of the ship-wrecked crews around the Andaman Sea necessitated the Government of India to form a penal colony in the islands. For the materialisation of such a proposal, Lord Cornwallis sent Lt. Blair and Lt. Colebrook to investigate into the possibilities of such a colonisation in the islands in the year 1788. In accordance with their investigations, the first settlement was established on Chatham Island* at Port Cornwallis (now Port Blair) consisting of a free colony. It was found that the North East harbour (now Port Cornwallis) was a better place for settlement because of its fine harbour and nearness to Calcutta. So, in 1792, the settlement was transferred

* Chatham Islands is the port of the Port Blair town and is a very small island.

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to the spot but it had to be shifted again to Port Blair because of the unhealthy climate and in consequence high mortality rates in that region.

But this settlement prospered little and for the next 60 years (uptil the second settlement) we have got very scanty records of the islands. The few important events are that in 1824 the British fleet were appointed at Port Cornwallis before the First Burmese War in 1825. J. E. Alexander landed, in a very interesting way in the Little Andaman, south of the South Andaman.

In 1837 Dr. Helfer, a Russian Geologist, was murdered by the aborigines while he was making expeditions into the islands in search of gold. In 1744 happened the queerly coincidental wrecks of the ships 'Runneymede' and 'Briton' bound for Calcutta with troops from Sydney and Gravesend respectively and there were various attacks on the troops by the Andamanese.

This period of great mishaps, shipwrecks and other disturbances made the government anxious. Fortunately for the British Government, this period synchronised with the Sepoy Mutiny in North India in 1857. Again a comprehensive report was submitted for making the islands a penal colony and in March 1858, the Andamans entered into second phase of its history as a penal settlement with the first lot of prisoners, 200 in number, and the mutineers of the Indian army who for the first time attempted to overthrow the British rule in India. They were accompanied by Dr. J. P. Walker. But the number increased to 773 within 3 months but 292 of them or 37 p.c. had escaped, died or were hanged.

Very strict measures were taken by Dr. Walker to deter these convicts from escape. But the administration of Dr. Walker was further weakened by frequent attacks of the Andamanese and this culminated in the Battle of Aberdeen on the 14th May, 1859. Dudh Nath Tewari, an escaped convict, who lived long with these aborigines, warned the settlement of the attack to be made in the Aberdeen, the heart of Port Blair, and as such proper steps were taken by the settlement to fight against the Andamanese. The escaped convict was released for his timely service.

Colonel J. C. Haughton (Oct., 1859) took the charge after Dr. Walker and he was a very loving personality amongst the convicts. He adopted a very humane method of treatment of convicts and established friendly relations with the Andamanese. In 1861 the administration of the Andamans was transferred from the control of the Government of India to the Chief Commissioner of Burma.

Colonel Taylor (1862) also adopted humane methods. 149 acres of land had been cleared for cultivation and there were some 3000 convicts

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in the settlement by 1864. In this period Lord Napier of Magdala visited the islands and suggested certain reforms. The Government of India sanctioned a grant for the formation of the "Andamanese Home" which aimed at improving the relations of the civilised people with the aborigines.

In 1863 General Man took the charge when the number of convicts increased to 8873 and 3000 acres of land were cleared, 876 acres of land were brought under plough and as a result health conditions improved and death-rates fell appreciably from 10.16% to 1.2%.

General Steward (1871) followed General Man and devoted himself to the agricultural developments of these islands and while on a visit to the Andamans he was murdered by a convict at Hope Town on the 8th February, 1872. In this year the administration was first raised to the rank of Chief Commissionership and the Andaman Regulations of 1874 were drafted, placing the settlement judicially under the Government of India, instead of under the High Court of Calcutta, and making provisions for the release of the life time convicts after 20-25 years of penal servitude if they showed good conduct.

General Steward was followed by Colonel T. Cadell, who was here for 13 years and attempted the great economic development of the settlement. The Forest Department was opened and the foundation of the Cellular Jail was laid down, though it was completed in the year 1905 and the recruitment of the labourers was made from the convicts only. The Cellular Jail claims to be the biggest masonry building in the Andamans, situated on the sea-coast.

Sir Richard Temple (1894-1903) also did many constructive works such as the considerable enlargement of the Phoenix Bay dockyard and workshops, and the initial arrangements for the reclamation of South Point—Aberdeen Swamps were completed in 1918.

Later came Colonel Douglas (1913-20) and the first suggestion for abolishing the penal colony was forwarded by him. A forest colony was started in North Andaman Division which had to be closed down due to the general trade depression and the most remarkable achievement was the plantation of cocoanuts over several thousands of acres which afterwards formed a source of large revenue.

Colonel Beadon's tenure (1920-23) marked a change in the administrative policy. Only 1400 Mapilla rebels and some Punjabis were received as convicts and the general convict strength fell from 11,532 to 8823. Unmarried women convicts and also some categories of male

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convicts were sent back to India. The convicts were provided with many facilities and they were also treated leniently. The cocoanut plantations developed by Colonel Douglas were made over to some private enterprises. Beadon contemplated various reforms and changes in the administrative policy of the Government, but failed to translate them into action due to the shortage of funds. The local-born association was started under the Presidentship of a Government Gazetted Officer for their welfare.

Colonel Ferrar (1923-31) possibly brought about the greatest changes in the island and with the closing of the penal settlement, schemes for colonisation and developments were necessary. The settlement in the Andamans had grown up in and around Port Blair in the South Andamans and everywhere the ephemeral huts of former times were giving way to well constructed two storied houses of sawn timber and iron roof, with stair cases, glared windows and other amenities. The old period of 10 years on probation as a labouring convict was abolished and after a few months' stay in the Cellular jail all the convicts found themselves placed on a wage basis and freed from the necessity of wearing convict dresses. During this time the willing convicts were allowed to go back to the mainland to bring their wives and families to the Andamans for permanent settlement. Many of the convicts, of course, returned back to the islands with frustrated mind as they were not recognised by their societies and families in the mainland to which they originally belonged.[1] All these changes in the administrative policy had their impact on the rural and urban population. In spite of the above cases, there was a rapid increase in the number of women and children in the Andamans and the social structure gained greater stability as regards the sex ratio, and this was probably a stepping stone to the successful approach towards colonisation.

A new deep-water jetty was built up at Chatham and was connected with the main island by a wooden bridge. Malarial swamps around the harbour were filled up by dredgers. A match factory was also built up at a cost of 3½ lakhs of rupees. Hence the period of Colonel Ferrar is a period of achievement when probably new life was infused into the people of the Andamans and had its effect on the all-round development of the South Andamans.

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1 Bonington, M.C.C.—Census Report, 1931.

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(3) *The Japanese Regime.*

Under such circumstances of smooth development in the Andamans, the World War II darkened the horizon and no other part of India was so badly affected by the war as were the Andamans. The Japanese Army landed here on the 21st March, 1942 and had these islands under their occupation till 1945. This period was really a reign of terror and tales relating to the extent of their terrorism can be heard from the people with first-hand knowledge. In the beginning the relations of the Japanese with the local people were quite amiable. But a few instances of treachery committed by the people to contact the British Government in their attempt to overthrow the Japanese rule changed their relation to a bitter one. Hundreds of local borns were killed on the least suspicious by the Japanese Government. Naval blockade prevented supplies from outside and the Japanese were the pioneers in making the Andamans self-sufficient. From high Japanese officials to menials, all people were compelled to cultivate lands in order to achieve self-sufficiency at home. They cultivated all the available lands including hill slopes where they grew sweet potatoes and tapioca. The Japanese are also believed to have bombed over the Jarawa areas and surely they killed some. On the 8th October, 1945, the S. E. A. C. took the surrender of the Japanese garrison at Port Blair and immediate steps were taken for the rehabilitation of the surviving population who were famished and ill-clad. The civil administration was re-established on the 7th February, 1946.

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Although the Japanese regime was a reign of terror, they at least showed the proper channel to develop the islands. They attained self-sufficiency in the Andamans, constructed 22 miles of road and tried for proper defence of the islands and developed industries based on local raw-materials. Whatever criticism may follow regarding such steps taken by the Japanese, it is to be believed that such isolated islands must follow this channel for their economic development.

(4) *Post-Independence Period.*

Since the 15th August, 1947 the Andaman and Nicobar Islands have shared independence with India. They now constitute the only 'D' class 'State' of the Republic of India, ruled by a Chief Commissioner directly nominated by the Indian President. Because of the meagreness of population adult franchise is not in vogue here and as such there is no representative from the Andamans in the Indian Parliament, but there is only one representative to the Parliament from the whole of the Andamans and the Nicobars nominated by the President of India. In the Andamans a local advisory

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council is nominated by the President of India on the recommendation of the Chief Commissioner which has been working in the islands for a few years.

The Government of the Andamans is attempting to colonise the islands successfully in collaboration with the Government of India, and in accordance with this principle the East Bengal refugees are being rehabilitated in the islands. An all-round economic development is aimed at and its supplementation depends upon the future Five Year Plans.

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CHAPTER III

PHYSICAL SET-UP

The Andaman & Nicobar Islands form a part of the continuous ridge which runs form the Cape Negrais of Burma through the Preparis and Coco Islands to the Andamans and continues further to the Nicobars and Sumatra. The whole ridge has a geological affinity with the Arakan Yoma of Burma and Sumatra and Java. The ridge is primarily of Eocene formation and forms a part of the great Alpine-Himalayan system. Prof. Gregory holds the view that "the main line continues eastward through the Himalaya until the resistance of the Chinese plateau has traced it southward and part of it now lies beneath the Bay of Bengal, it reappears in Sumatra and continues through Java and across the Malaya Archipelago."[1] But some modifications of Gregory's view have been achieved and presently it is believed that this ridge is a loop of the main Himalayan axis comparable to the Persian loop in western Asia and Apennine loop in Europe.[2] The ridge is not continuous but is interrupted in many places, of which the 3 main channels are worth considering. The depth of the channels increases from north to south. 133

(1) Preparis channel in between north and south Preparis islands has a depth of over 500 fathoms.

(2) The Degree Channel, between the Andamans and the Nicobars, is approximately 400 fathoms deep.

(3) Great Channel lying between Great Nicobar Island and Sumatra is about 750 to 800 fathoms deep.

The peaks of the mountains now form the islands and in some places the coastline slopes very steeply to the ocean.

GEOLOGY OF THE ANDAMANS

The present knowledge of the geology of the islands is largely the outcome of the investigations done by R. D. Oldham (1885), Kurz (1868), Gee, and G. H. Tipper. Even at present a thorough geological knowledge of the islands has not been achieved and this has been due to a number [114]

1. Gregory, J. W.—The Structure of Asia, London, Methuen. [113]
2. Swell, R. B. (1925)—Geography of the Andaman Basin, Geographic and Oceanographic Researches in Indian waters, Mem. Asiatic, Soc Bengal IX, No. 1.

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MAP OF THE GEOLOGY OF THE ANDAMANS

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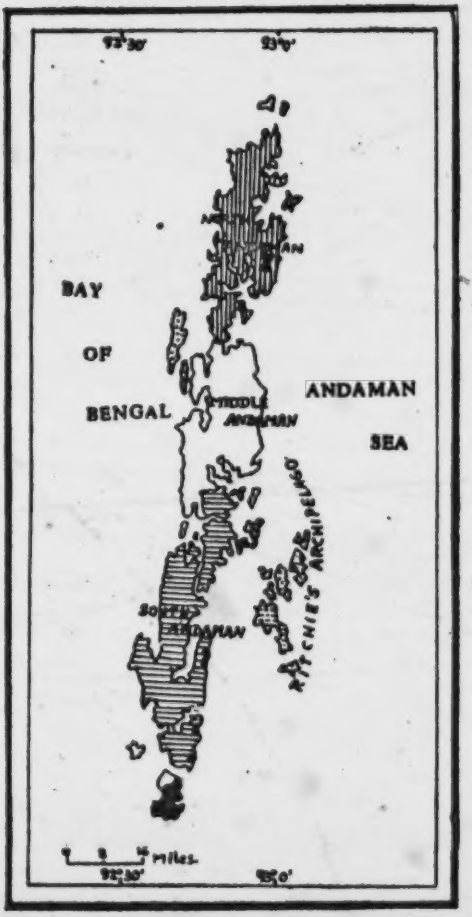

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of reasons. Firstly, a thorough survey of the islands is very difficult because of the dense forests and hostile aborigines. Secondly, the Government also cared little to take pains for initiating such a work. Regarding the inconveniences of geologising Tipper writes "the thickness of the jungles may be judged from the fact that our rate of progress varied from half a mile to a mile an hour. The dense jungle with a lack of exposures made geologising very difficult."[1]

Rink first postulated that the Andaman-Nicobar ridge was elevated to its present height from ocean bottom. He describes the chain of islands as consisting "partly of those stratified deposits which occupied the level bottom of the sea before their appearance, and partly of plutonic rocks which pierced through the former and came to the surface through upheaval.

To the two above-mentioned formations has to be added a third, which is the result of the chemical and mechanical destruction of the plutonic masses; it is local and consists of clays and pebbles derived from the underlying strata."

On the whole, the mountain ranges of the Andamans are of sandstones of Eocene Age with intensive rocks of serpentine in places. Large parts of the North Andaman have been grouped under the Archipelago Series by Oldham. Tipper considers the conglomerates of North and Middle Andamans as a facies of the Eocene deposit. Between the mountain ranges which run north to south, some undulating ground is found which often consists of impermeable blue clay beds, indurated shales and conglomerates containing pebbles of quartz and jasper. Coral reefs and the raised beaches form the recent and sub-recent formation of the Andamans. The formation of the Andaman-Nicobar ridge has been assigned to late Cretaceous age.

Oldham has distinguished two sedimentary formations in the Andamans besides serpentine series. He named them as

(1) Port Blair Series, &
(2) Archipelago Series[2]

The Port Blair series is so named because it is dominant in and around Port Blair, i.e., in the South Andaman. The rock types are gray sandstones with interbedded slaty shales, frequently consisting nests

1. Tipper, G. H.—The geology of the Andaman Islands with reference to the Nicobars. Mem. Geol. Sur. Ind., Vol 35, Part 4.

2. Oldham, R. D.—Notes on the Geology of the Andaman Islands, Rec. Geol. Sur. of Ind., Vol. 18, Part 3, 1885.

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133 of coaly matter and occasionally beds of conglomerate and pale gray limestone as subsidiary members.

The Archipelago series, as the name implies, is dominant in the islands of the Archipelago group. It consists of soft limestones formed of coral and shell—and, soft calcareous sandstones and soft white clays with occasionally a band of conglomerates.

Later on G. H. Tipper further clarified the geology of the Andamans and as analysed by Tipper, the 'Port Blair Series' and 'Archipelago Series' of Oldham correspond to Eocene (Lower Lutetian) and Miocene formations respectively. According to Tipper, the greatest authority of the geology of the Andamans, the following formations have been distinguished in the Andamans:—

Recent and sub-recent	... Raised beaches and coral reef etc.
Miocene	... Clays of Ritchie's Archipelago.
Miocene (Burdigalian)	... Foraminiferal limestones, shell marks of Paget Island.
Eocene (Lower Lutetian)	... Conglomerates of the North and Middle Islands. Sandstones of the South Islands.
Cretaceous	... Serpentine Series.
Pre-tertiary	... In part lower Cretaceous, scattered expanses of quartzites, jaspers and porcellanic limestones.

Of all formations, the Eocene rocks are most widely prevalent. They occupy the 3 main islands i.e., North, Middle and South Andamans and have got two facies of the same deposit. In the North and part of the Middle Andamans the prevailing rock is conglomerate while in the South Andaman it is sandstone.

The Sandstone Area of the South.

The sandstones of the South are even-grained blue grey micaceous sandstones but are sometimes non-micaceous and calcareous intercalated slabs are frequent. Conglomerates also occur in white quartz pebbles of sandy matrix. The rocks have experienced honey-comb weathering because of the irregular distribution of the cementing materials.

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[114] It should be remembered that the geological survey of the Middle Andaman has not been done properly.

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The Conglomerates of the North.

The Conglomerates, as said, occupy almost the whole area of the North Island. The Conglomerates vary considerably in character from a very coarse form with large rounded pebbles to a sandstone. The pebbles are usually rounded and not angular. 133

Miocene (Burdigalian) Deposit.

Foraminiferal limestones occupy large areas of the west coast of the Middle and North Andamans including Interview, Paget, Whitecliff and Thorn hills islands. These beds rest directly but unconformably on the Eocene conglomerates. The rocks vary in degree in different places. The rocks of Interview island are compact limestones with a few quartz grains, that of Paget island are soft foraminiferal sands. On Interview island a large number of long pits, narrow and of considerable depth are found. According to Tipper, they are "due to the falling in of the roofs of the underground streams." The limestone is in places very conspicuous and this feature has boldly made its appearance because of the hardness of the limestone and its action with the rain water.

Other Miocene Rocks.

These rocks have been classified by Oldham as the 'Archipelago Series.' The strata composing these islands consist of soft non-calcareous clays. The conglomerates of the North and Middle Islands, as has already been said, were classified under this group. But later investigations by Tipper and others proved the distinction of the two series. Almost the whole of the Ritchie's Archipelago is composed of this series. There is a good deal of controversy regarding the origin of this clay formation. Ehrenburg (1850) holds the view that this series has been elevated from a considerable depth below the sea level and this is proved by the absence of $CaCO_3$. As Boggild (1916) has shown that the absence of $CaCO_3$ is a characteristic feature of this deep-sea deposit, these non-calcareous clays are held to be of deep-sea deposit and believed by Ehrenburg to be identical with the deposits found in Barbadoes. But the absence of $CaCO_3$ in the deposits near the mouths of the rivers have also been shown by Swell (1925). But what is now accepted is the view held by Tipper and Oldham. They believe that the clay deposits in the Andamans and those in the Nicobars are geologically identical and moreover, have arrived at the conclusion that the deposit has been formed by the breaking down of the older ser-

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133 pentine rocks and the deposition took place in comparatively shallow water in an estuarine or brackish water sea.

Serpentine Series.

These are igneous rocks covering large areas in the Andamans. They occur at Saddle peak and Saddle hill, Rutland and Cinque islands and many other places. The chief rock is a darkgreen serpentine with veins of chrysolite. The serpentine is basic in character and is derived chiefly from olivine and in part from horn-blende. Somebody believes that the serpentines intruded into the Tertiary sediments but evidences of contact metamorphism could be detected in such a case. In the basic rocks great alteration due to contact metamorphism does not take place, but at least some traces of it should be found around the great mass of Saddle peak had it intruded into the adjacent tertiary sediments. But such is not the case. This serpentine series synchronised with the great intrusions of serpentines, peridolite grabbos and clorite in Baluchistan and elsewhere in India which are of upper Cretaceous age. The Eocene conglomerates of the North Andaman are formed of the fragments and pebbles of the serpentines.

The Pre-tertiary Sedimentary Rocks.

Red and yellow jaspers, quartzites and pink and white porcellanic limenstones are the pre-tertiary sedimentary rocks which occur in isolated patches. The exact age of the rocks has not yet been determined. Weathered jasper pebbles are very common in the Eocene conglomerates of the North Andaman. Similar occurrences of jaspers and quartzites are found in Manipur and Arakan Yoma.

The Recent and Sub-Recent Formations.

The recent formations of the Andamans are the raised beaches and coral reefs. The growth of the raised beaches and coral reefs has been analysed in the light of the upheaval of the Andaman-Nicobar ridge which is believed to be still rising. This process of upheaval is slowly continuing and the same seems to be the case further to be north in the Arakan district of Burma.

The South Sentinel Island is composed of corals raised to a few feet. The N. Sentinel Island is also said to be of raised coral. Swell also detected one or two localities of reef coral that now form part of the shore and are raised considerably above the high water level. Since these beds must have originated at some depth below sea level it seems clear that elevation has taken place quite recently.

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Hence the formation of the coral reefs and raised beaches can be accounted for only if we believe in the recent upheaval of the Andaman-Nicobar ridge. Let us see the evidences that are in favour of this upheaval and those against it. Swell and Tipper believe that the Andaman-Nicobar ridge has experienced an apparent elevation of land which is only possible through the eustatic change of water-level. They have put forward a number of arguments that are as follows:

(1) The formation of coral reefs is possible only if there be an apparent or true elevation of the land.

(2) Throughout the tropical belt there are evidences of an apparent elevation of land in comparatively recent times.

(3) At the South West corner of Rutland Island in the Andaman Group, there is a raised pebble beach, situated 5'-6" above the top-level.

(4) At the southwest end of the westermost of the Twin Islands, off the west side of the Rutland Island, is a raised beach of shingle-conglomerates, about 6' ft. above high water-mark. This apparent upheaval of the land i.e. fall of the sea-level is believed to have been caused by the climatic fluctuations in the Quaternary period causing glacial and interglacial periods which resulted in a fall and rise of the water-level respectively.

But Kurz (1868) does not believe in the recent upheaval of the Andamans, but he holds the opposite view. The advocacy of Kurz in favour of the sinking of the Andamans is also due to a number of reasons.

Kurz had his conclusion from the botanical aspect of the coastal region. Kurz says, "some of the stumps of the trees (along the shore) proved to belong to such species as never grew in the mangrove swamps, and in any locality such as that in which they are now standing. They appeared to me to belong to *Pongamia, Erythrina, Thesperia* and even to *Manusops Indica,* accompanied by strongly buttressed trunks. Also trunks of *Bruguiera-gymnarhiza* are frequent and of a larger size than those which grow close to the shores but apparently agreeing with those which are everywhere found further up the creeks. All these (except the last mentioned) are trees which never occur in the mangrove swamps, but in the sandy soil just behind them or else bordering the sea where the shores are very steep and not adapted to the formation of mangrove swamps."[1] This evidently leads one to believe that the

1. Kurz. S—On the vegetation of the Andaman Islands, Calcutta.

10; Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2

[133] [137] Andamans are sinking so that the trees which are found in the sandy soils behind the mangrove swampo are seen to be amidst them.

The sinking state of the Andamans has been further shown by quoting the reports of the Andaman Committee (1858)[2]. It is stated that the sea had encroached upon some 40′ or 50′ feet since the first settlement at Chatham Island in Port Cornwallis so that the store house that stood up there has been destroyed by the sea since the abandonment of the place since 1796. Again the Hamfray's strait changed a good deal in a very short margin of time. The easiness with which Helfer[3] in 1858 sailed through the strait became unnavigable later on except for small boats, as pointed out by the Andaman Committee. These facts not only prove the sinking state of the islands but also the rapidity with which the sinking is taking place. But the view has been strongly disputed by Tipper and Swell. Swell believes that whatever evidence that is found in favour of sinking is completely due to local change of level and Tipper argues that the coastal regions have slipped downwards to the sea giving rise to the evidences of sinking. He says that the structure of the Andamans may allow such slips into the sea.

Thus the enigma of the problem remains unsolved. Even in recent years the Ross Island off the Port Blair coast has been found to sink down into the sea. We have to scrutinize that this sinking which is evidenced in many parts of the Andamans is whether due to a new phase of sinking after the cessation of the upheaval of the islands which created the coral reefs, raised beaches etc. or due to the slip of the coastal region into the sea.

The direct connection of the Andaman and Nicobar islands with the mainland is still a controversial matter. But it is held by Mr. Kurz that the Andamans were connected with the mainlands which he concluded largely from his observations of the botanical aspect of the islands. In describing the flora of the Andamans he remarks "one may presume that a great number of species which originally grew in countries now submerged between these islands, Burmah and Hindoostan, have been repelled by the advancing sea and vegetation has thus become comparatively richer in generic types as the area grew smaller." Swell argues if at all any land connection of the islands with the mainland would have occurred, it would have surely been broken before the evolution of

[113] 2. Bonington, M.C.C.—The Andaman and Nicobar Islands, Census of India, 1931.

3. Helfer, a Russian geologist, while prospecting the islands in search of gold was killed by the aborigines.

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2

the mammalia took place because no indigenous land mammal occurs in any of these islands with the possible exception of a species of Paradoxurus and an insectivore which have been captured in the Andamans, but which, so far we know, do not occur in any of the Nicobar Islands. Again Boden Kloss (1903) from a study of the mammalian and avian fauna reached the conclusion that these islands were never connected with the mainland. Since the mammalia made their appearance towards the close of the Triassic period and the Andaman-Nicobar ridge did not apparently rise from the sea-bottom before the late Cretaceous epoch, it is certainly difficult to see how any connection with the mainland can reasonably be postulated. But the geologists believe that originally the whole chain of islands was continuous presumably above sea-level but the continuity of the original mountain has been broken by wide gaps which, in the western part of the Burmese-Malay arc, for example, are larger than remnants.

PHYSIOGRAPHY OF THE ANDAMANS

The Andamans abound in hills and lack in lowlands. From a distance the islands look like a long north-south running vista of domes. The hills are so low that they may be called domes. The hill-ranges have a north-south alignment and between these systems lie depressions where either the sea encroaches and forms a longitudinal bay or plain lands. The cost line is not broken everywhere but so in places such as the southeastern coast of the Middle Andaman, southeast coast of the North Andaman, northwest coast of North Andaman, western coast of the Baratang Island. Here the coastline seems to be of emergent type and the mangrove swamps encroach far into the sea (c. f. Sunderban area) and this feature is particularly significant in the east coast of the Middle Andaman. The whole coast seems to be mantled by a dense cover of mangrove swamps for miles together. The views of Mr. Kurz regarding the recent sinking of the island seem to be true from the physiographic outline of the coastline. Here also the answer of the question is a problematic one as to whether the Andamans are really sinking or not. The evidences of sinking have been argued to be due to local causes only by Mr. Swell or due to the slip of the coastal region towards the sea by Mr. Tipper. Hence the question is still a controversial one and the authoritative suggestions made by Mr. Swell, Mr Tipper and Mr. Gee cannot be taken as final and this problem again needs other forms of analysis from the other morphological studies of the islands.

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2

131 The Andamans consist of 204 islands of which the important islands of the main body from north to south are North Andaman, Middle Andaman, Baratang Island, South Andaman, Rutland and Little Andaman. Another group of islands lie some 15-20 miles off the east coast of Middle Andaman and they are primarily a group of a few islands-Neill, Havelock, Peet Is, Wilson Is, John Lawrence Is, Henry Lawrence Is, known as Ritchie's Archipelago.

PHYSIOGRAPHY OF THE ANDAMANS

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As has already been said, main Andaman group of islands is of Eocene formation (with sandstones in the South and conglomerates in the North) and the Ritchie's Archipelago is of later formation i.e. of Miocene age, built up of clays and forminiferal limestones. From a symmetry of the alignment of the mountain ranges, the Andamans can be divided into a few physiographic regions. 133

(1) The Cholunga Range in South Andaman (it lies in the middle of the South Andamans) and its continuation through the mountain ranges along the west coast of Middle Andaman to Ranger Island.

(2) The Mount Harriet Range along the east of the South Aadaman continue through the Baratang range to the hill range of North Andaman.

(3) The West Coast Range has its continuation in the Interview Island.

(4) East Coast range of North Andaman runs down towards the south to the East Coast ranges of Middle Aadaman.

(5) Intervening lowlands in between these longitudinal mountain ranges.

(6) Coastal Lowlands.

Regarding the mountain ranges, on the whole, some peculiarities have been observed. It is observed that this range of mountain system which is a continuation of the Arakan Yoma and runs right upto Sumatra has a gradual decrease and then an increase in height from north to south. A list of important mountains in series from north to south are as follows:— 103 133

	Name of the peak		Height above the sea level	
Arakan Range, Burma	Chypotong	...	8386	feet
	Chinsikiatong	...	6012	,,
	Mengootsan	...	3600	,,
Andaman-Nicobar ridge	North Andaman	...	2902	,,
	Middle ,,	...	1678	,,
	Little ,,	...	600	,,
	Car Nicobar	...	200	,,
	Batti Malv	...	150	,,
	Choura	...	343	,,
	Katchal	...	835	,,
	Little Nicobar	...	1428	,,
	Great Nicobar	...	2705	,,
Sumatra	Batu Mukurah	...	6371	,,
	Sinobong	...	12,140	,,

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2

PHYSIOGRAPHIC DIVISIONS OF THE ANDAMANS

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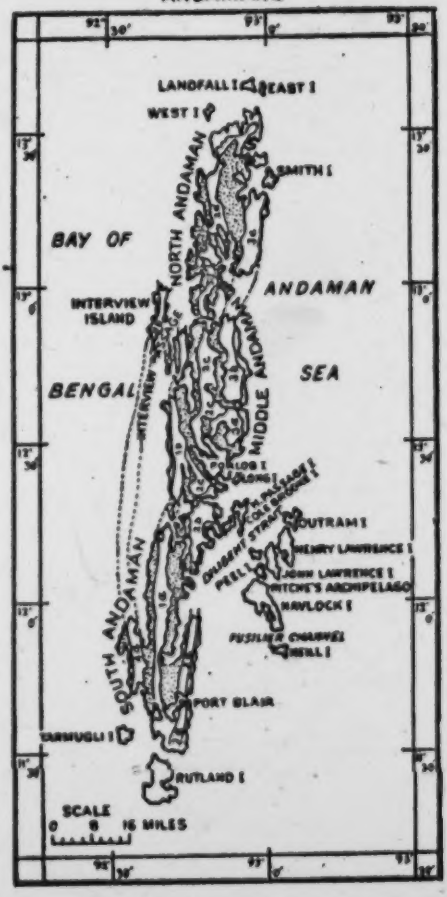

133 According to Swell, these variations in height are due to (1) an alteration of the pitch of the axis or (2) a variation in the rate of weathering and denudation in different regions. Swell says "A gradual fall towards the south and a subsequent rise in the level of the ridge, the differences between the highest peaks at each end, which rise to well over 8000' and the lowest of the peaks in the middle, namely, the island of Batti Malv which is only 150' above sea-level, is at the least some 8000' or approximately

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2

1340 fathoms and it would appear probable that there has been, since the first formation of this mountain chain, a secondary depression that has lowered the level of the range in this area by approximately this amount." Molengraff[1] has called attention to the fact that similar depression, though on a smaller scale, exists further to the south in the continuation of the chain through the Malay Archipelago to the east of the Tima island, though on Tima Island itself there is incontestable proof of a post-tertiary elevation in the shape of a succession of coral reef terraces that are raised high above the present sea level. 133

The alignment of the hill systems in the Andamans, though not fully, but closely resembles the basin and range topography. In between the mountain ranges lie the longitudinal bays into which a number of very short torrential streams flow from both sides. The Andaman Committee observed that "the highest land wherever seen is on the eastern side" and that "the watershed is therefore chiefly to the west and it is consequently on that side that the marshy localities will most probably be found". But this observation is far from true which will be evident from the discussion below.

The east coast has really higher hills, but in the west coast also we find hills above 1000′ in height (1109′ in the Middle Andaman). Again, the second view is wholly untenable because of the fact that there is abundance of marshy localities in the east coast region than west coast.

Again, a greater number of rivers as well as the important ones viz, Batapur, etc. flow into the east coast.

West Coast Range of South Andaman and its continuation into the Interview Island is probably the lowest hill-system in the Andamans. The peak-height rises more than 800′ ft. Typical sandstone topography is manifested in the landscape of the region where all the hills are flat topped.

The hill ranges of the west coast, especially of the south west being under the direct impact of the southwest monsoons are lower than that of the east because of greater rainfall in the west, particularly the southwest, which results in a rapid erosion of the hills and, consequently lowering in height.

Cholunga Range and its continuation upto the Rangers Island are one of the highest ranges of the Andamans. It runs through the middle

1. Molengraff, G.A.F., Modern deep-sea researches in the East Indian Archipelago, Geog. Jour, 1921.

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2

133 of South Andaman, where on its both sides are longitudinal bays. Further the range runs along the west coast of the Middle Andaman and merges into the Ranger Island. In this range the important peaks from south to north are Mt. Ford (1426') in Rutland, Cholunga (1057') and Cadell (1163') in South Andaman and one unnamed peak (1016') in the west coast of Middle Andaman.

Further east, the longitudinal range is the Mount Harriet Range which runs further north through Baratang Island and the middle of the Middle Andamans to the west coast range of North Andaman. The Mt. Harriet Range in South Andaman is the highest part of this region which rises steeply from the east coast of South Andaman and the peak heights are Mt. Harriet (1196') and Koyob (1509'). In Baratang and Middle Andaman the height of the range decreases considerably and in the former the height never exceeds 700' feet. Again, in the North Hudson peak-height of 1109 ' is observed.

Along the east coast of North Andaman and Middle Aadaman lies the highest mountain range of the Andamans and next to it is the Cholunga Range. The important peaks in North Andaman are Saddle Peak (2402') and Jire Miku (2247'), the former being the highest peak in the whole of the Andamans. In Middle Andaman, peak heights of Mt. Dianolo (1678') and many others of more than 1000' have been observed.

In general the hill-ranges are low in height never exceeding 2500' and they send out spurs in all directions. On an average, of course, the east coast ranges are steeper than the west coast ranges and all these ranges are under the deep mantle of orest cover.

The depressions that lie in between the mountain ranges are either longitudinal bays and in a few cases river valleys. In between the west coast range and Cholunga range in the South Andaman are the Blair Reach and Dalrymple Reach and again in between the Interview Island and the North and Middle Andaman are the Buchanan Passage, Interview Passage and Austin harbour.

Between the Cholunga Range and its continuation and the Mt. Harriet Range and its continuation, lies the School Bay Creek in the South Andaman into which very short, non-perennial streams flow from the hill ranges of both sides. Again, in between the Baratang hill range and Cholunga Range continuation, lie the Amitla Doicha Passage, Needham Reach and Yaratil Jig, Melagi Bay, Lukhlriwath Bolyo and Arad Bay in the North Andaman.

In between the East West Range of North and Middle Andamans and the Harriet Range continuation in the North, lie the Blair Bay, Kalporg

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Bay, Kalara Bay, Congo Bay etc. in the North Andaman and Betapur river valley and Bomlungta river valley in the Middle Andaman.

Hydrography.

The study of the hydrography of a region includes petamology (study of rivers), limnology (lakes), cryology (snow) and geohydrology (underground water). The study of limnology and cryology of this region can be completely omitted because there is a complete absence of both lakes as well as snows or glaciers. Of the rest the geo-hydrology of the Andamans is little known because no research work regarding this aspect has been conducted.

The petmology or the study of rivers is the most important object of hydrology. The rivers are very short, non-perennial as well as torrential in character. They can better be called as streams because of their seasonal drying up and short length. The Andamans enjoy quite heavy rainfall of about 130", but because of the seasonal fall, the water-level of the streams fluctuates very greatly and in the dry season most of the rivers either do not have any water or have only a trickle of water. Little water in the river valleys may also be partially due to the pervious nature of the soil which does not help the water-table of the region to be sufficiently high. The greater as well as continuous rainfall throughout the year in the South Andaman keep the rivers almost perennial.

[132] [134] [132]

The Middle Andaman has only a few little rivers and they are Betapur and Bamlangta rivers. Both of them rise from the hill ranges of the continuation of Mt. Harriet Range in Middle Andaman and flow through the longitudinal valleys, and are interrupted by a great number of spurs from both the eastern and the western hill ranges. The Betapur river rises in the north of Middle Andaman and flows towards the south with a number of tributaries from both the ranges on both the sides. Almost the whole of the northeast Middle Andaman is drained by the Betapur river and its tributaries. According to Mr. Sethi, the country from the place where the Picha Nala meets the Betapur stream, though interrupted by small hills, is almost level for 7 or 8 miles.

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CHAPTER IV

CLIMATE OF THE ANDAMANS

132 The situation of the Andamans between 10°30′ and 13°30′ north latitudes and 92°15′ and 93°10′ east longitudes makes the climate of these islands of the tropical type which closely approximates to the Equatorial one in the south. The islands are frequently disturbed by tropical storms and cyclones in specific months. The insular position of the islands in the Bay of Bengal in between two countries in the east and west, situation in the tropical zone, location in the path of travelling tropical storms and cyclones in specific months, influence of the tropical maritime air masses in the south and the air masses of the subcontinent of India and other countries of Asia in the north, considerable northsouth extension but appreciably small eastwest extension, broken coastline and peculiar shape, and the dominant functional controls of the northeast and southwest monsoons in the specific months of the year have all combined together to give a distinct feature of the climate of the Andamans. The influence of all these factors, in giving a characteristic impress over the islands, must be understood before we consider the general conditions of climate and the division of the islands into different such regimes and the influence of climate on agriculture.

THE DIFFERENT CLIMATIC CONTROLS.

Insular Position and Shape.

131 The insularity of the islands is obvious because of their presence in
132 the base of the funnel of the Bay of Bengal. The funnel is enclosed in the west and east by the east coast of the Indian mainland and the west coasts of Burma and Malay, and both these coastlines taper in the north in the deltaic region of Bengal. In the south the whole sea opens out and extends upto the Antartica. The islands, being 192 miles long and 32 miles wide, when maximum, with a number of bays and creeks penetrating deep into the interior of the islands make no spot on the Andamans more than 10 miles from the sea. This has helped the development of the maritime conditions of the islands at its maximum and has therefore, led to a great moderating influence of sea on temperature.

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2

Control of the Air-Masses All Around The Islands.

In the south of the islands is the presence of the tropical maritime air mass (mfu) of the convergent type which is characteristic of equatorial regions over continents and oceans. This type of air mass is highly charged with humidity and it produces abundant cumulonimbus clouds and consequently causes heavy showers, "even in the absence of strong trigger action. Then while neutral mfu air usually requires strong trigger action to produce heavy showers, convergent mfu air provides an environment in which strong convection is easily induced."[1]

The trigger action for the movement of the air masses and consequent release of its energy in the form of rainfall is provided by the land mass in the north i.e. India as well as the whole of Asia. The conditions in July are highly favourable for the growth of a centre of low pressure in the northeast and a secondary one over the northwest India because of its continental character and simultaneously with it has developed a centre of high pressure over the Indian ocean south of the 30°N latitude. Such a development of the pressure gradients necessarily initiates the energy for the movement of the heavy air masses over the Indian ocean towards the northwest and after crossing the equator towards the northeast. This is what is known as the southwest monsoon which because of its passage towards higher latitudes (with a gradual decrease in temperature) accelerates the tremendous release of the energy of the air masses and causes a very heavy rainfall. The Andamans facing the full force of the southwest monsoon experiences heavy rainfall during this season and during this period the maximum rainfall occurs in the islands.

In the cold-season, with the beginning of January, the conditions are reversed. The former seats of low pressure are replaced by high pressure and the comparatively heavier air masses move towards the south (in general sense). The winds from the Indian mainland as well as China blows towards the south and a major stream in the Bay of Bengal. Here again the islands experience rainfall of the northeast monsoon which is comparatively lower in amount.

Location of the Islands in the Path of the Travelling Tropical Storms and Cyclones.

The tropical cyclones originate in low latitudes within or along the margins of the equatorial calms. Generally the tropical cyclones do not

1. Trewartha, G. T.—An introduction to climate, Methuen, London.

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2

132 originate within areas of prevailing steady or strong winds. It has been investigated by S. C. Roy and A. K. Roy[1] that the cyclones are predominant over Bay of Bengal during the transition period. "In the beginning of the hot weather in India in April, a slow current of the southwesterly winds of local original sets in the north of the Bay of Bengal. The winds become irregular in the southern parts of the Bay. But northerly and northwesterly winds of land-origin still prevail on the Arabian Sea. By May the southwesterly winds of local origin dominate the whole of the Bay and set in also over the west of the Arabian sea. During this transition period oceanic air of great depth occasionally penetrate into the south of the Indian seas. The overrunning of the local southwest winds by the oceanic winds or the encounter of the northwest land winds with the oceanic winds result in the formation of cyclones."

Andamans not only experience the tropical cyclones during the transition period but also a number of typhoons, which originate in the China seas; their remnants, after travelling across south China and Burma or across Indo-China and Siam, intensify again into storms in the Bay of Bengal. Hence the full force of these storms are experienced in the islands.

TABLE I

Frequency of Cyclones

	J	F	M	A	M	J	J	A	S	O	N	D
Bay of Bengal	2	0	1	8	18	9	3	3	5	27	16	8

TABLE II

Percentage frequency of severe cyclones

	J	F	M	A	M	J	J	A	S	O	N	D
Bay of Bengal	0	0	2	8	18	5	3	2	8	22	24	8

GENERAL CLIMATIC CONDITIONS

The islands have very little annual variation, being 3° to 5°F for mean temperature and 4° to 7°F for mean maximum temperature. The annual mean maximum temperature varies from 85° to 87°F, and mean minimum from 75° to 77°F and mean temperature from 79° to 82°F. The relative humidity is also very high and the average is 80%.

1 Roy, S. C. & Roy, A. K. Structure and Movement of Cyclones in the Indian seas.

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2

The high temperature coupled with the high relative humidity gives rise to a high sensible temperature. The weather is always warm and very sultry but is tempered to some extent by the pleasant sea breezes.

There is no rainless month in the South Andaman and the rain is received both from the southwest and northeast monsoons. As one goes towards the north of the islands the amount of rainfall decreases. During the southwest monsoon rain continues for days together.

During the transition period there are frequent cyclonic disturbances in the islands and some of them are so violent that they create havoc to navigation as well as settlement.

The diurnal variation in temperature is not at all great and the sky is at any moment overcast with clouds which may cause rainfall from a few minutes to a few hours.

TABLE III

Temperature conditions in (°F)

	J	F	M	A	M	J	J	A	S	O	N	D
Port Blair (11° 40' N & 92° 43' E)												
Mean Maximum	84·2	85·3	87·5	89·1	86·7	84·3	83·8	83·4	83·1	83·9	83·9	83·6
Mean Minimum	71·6	70·5	71·3	74·7	75·6	75·0	75·1	74·7	73·8	73·8	73·5	72·9
Long Island												
Mean Maximum	85·7	79·2	83·3	84·8	84·2	82·8	81·4	81·0	80·1	83·0	82·2	81·8
Mean Minimum	72·7	74·6	77·1	79·1	79·8	79·8	78·6	78·6	78·0	78·8	76·9	76·9
Mayabunder												
Mean Maximum	83·6	79·5	83·1	85·1	83·9	82·5	81·4	80·7	80·1	82·1	82·4	80·9
Mean Maximum	71·6	74·9	77·6	79·2	79·5	79·4	77·9	77·9	77·18	75·9	7·5	75·5

April is the warmest month of the year. The lowest mean temperature, however, does not occur in a particular month in all the parts. There is a tendency for this to take place in February in the northern half of the islands and during October and November in the southern half. The highest and lowest temperature ever recorded in the islands are 97°F and 62°F respectively. Even though the islands have a latitudinal extension of 3°, the change of temperature from north to south is not marked. Due to the heavy clouds over Port Blair, temperature is appreciably reduced.

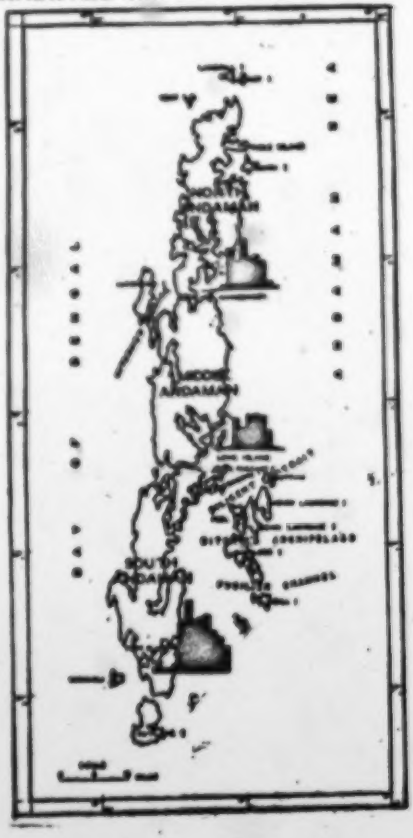
10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2

Rainfall Conditions

132 The islands experience fairly good rainfall, as already said, from both the southwest and northeast monsoons. The southwest monsoon brings the maximum amount of rainfall. The regional distribution of the rainfall is very uneven. The Table Island situated in the northeast part of the islands has an annual average of 76". Long Island off the east coast of the Middle Andaman 55.95", Mayabunder 69.12" and Port Blair in the South Andaman 123". Broadly speaking, the amount of rainfall decreases as one goes towards the north as well as to the northeast. The southwest region experiences the maximum amount

[102]

RAINFALL MAP OF THE ANDAMANS



10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2

of rainfall because it comes first under the impact of the southwest monsoon. As the old observatories at Port Blair and Nancowrie are located on the leeward side it is probable that at stations on the windward side in these areas the rainfall is heavier (probably more than 140"). This greater amount of rainfall helps the development of a denser tropical vegetation in the western coast.

The southwest monsoon burst over the South Andaman by about 20th May (15th June at Calcutta) accompanied by thunder and rain. In May the number of rainy days is 16, in June 21, in July 26 and in August almost on all days. But the amount of rainfall is not maximum in August (16.29") which is so in the month of June.

The two periods of maximum precipitation are

(a) May and June, and

(b) September and October.

which correspond to the beginning and the end of the southwest monsoon.

The rainfall of the northeast monsoon begins from the month of October.

January and February are almost rainless months in the northern stations. Port Blair experiences rainfall almost throughout the whole year but the fluctuations of seasonal rainfall are quite large (1.11" in February and 21.75" in June). The highest annual rainfall recorded during the last 60 years is 150" and the lowest is 84".

TABLE IV

Rainfall in inches

	J	F	M	A	M	J	J	A	S	O	N	D
Port Blair	1·79	1·11	1·12	2·36	15·13	21·75	15·43	16·29	17·40	12·51	10·52	7·92
Long Island	0	0	0·11	0·48	9·65	6·62	10·62	10·68	10·30	6·00	0·87	0·62
Mayabunder	0	0	0·19	1·20	12·10	8·38	15·43	9·94	10·00	8·81	2·03	0·92

Table Island—Data not available.

Humidity

It is high throughout the year being highest during the southwest monsoon when the average is as much as 90% and on individual days the atmosphere may be saturated. The lowest humidity occurs during December to February when it varies from 72 to 75%. The annual variation is about 15%. The humidity in the south is more than in the north.

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2

132 Clouding in all the months is more than 13th of the sky and is maximum in the monsoon months being about 8 to 9/10ths. On 2 out of 3 days, sky is overcast in these months.

Wind

The islands are generally windy, particularly Table Island and Port Blair where in July the average wind speed is 15 m.p.h.

TABLE V

Mean daily wind speed in m.p.h.

	J	F	M	A	M	J	J	A	S	O	N	D
Port Blair	8·8	7·1	5·9	8·6	13·7	15·9	13·4	10·4	7·6	8·4	9·1	9·5
Table Island	6·9	6·1	5·7	6·0	10·4	15·0	16·2	12·2	7·6	7·1	8·0	9·0

During November to February, winds are mainly from the north and east and during southwest monsoon months from west and southwest. The months of March and April are transition months.

Thunder

The islands experience thunders in about 45 days out of a year. From March to October, each month experiences more than 3 thunders. The most thundery months are April, May and June with not less than 8 thunders a day.

THE CLIMATIC SEASONS

As already said, the temperature of the Andamans is more or less uniform throughout the year but the rainfall fluctuates with the change of season. In spite of the equable nature of the climate, a few climatic seasons are experienced in the islands because of the mechanism of the two monsoons in two specific periods, passage of cyclone during the transition time etc.

(1) Cool season — From December to February
(2) Hot season — From March to Mid-May
(3) Southwest monsoon season — From Mid. May to Mid. October.
(4) Post southwest monsoon season — From Mid. October to November.

Cool Season

This season has a mean maximum temperature of about 83° to 87°F and a mean minimum temperature of 71° to 78°F. The temperature is not at all low as compared to the maximum one. A temperature below 60°F has never been recorded in Port Blair.

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2

Port Blair records 8" rainfall in December. 1" to 2" in January and February. In the stations of the north these months are almost rainless. However some very heavy falls, 11.6" in a day in December, 8.2" in January and 5.2" in February have been recorded. Some severe storms are experienced in this season which are formed in the neighbourhood of the Nicobars, usually to the northwest. Occasionally some storms formed in the southwest part of the Bay proceed northwest and north and finally recurve into the northeast and affect the Andamans. More than 70% of the winds in this season blow from the north, northeast and east. As one goes towards the south pressure decreases but the pressure gradient is low. 132

Hot Season.

April is the hottest month with a mean maximum temperature of 89° to 90°F and a mean minimum temperature of 75° to 80°F. Even during the hottest spells the temperature does not exceed 97°F. Generally little amount of rain occurs in March and it increases in April and very much in May. Rainfall in April and May are of thundery type usually occuring in the afternoon and the evening. On an average 8 thunderstorms are experienced during April and May. The number of tropical storms also increases from March to May. Many of the storms in April and in the later part of the month originate in the neighbourhood of the Andamans, usually to the southwest of them. The storms generally move towards the north and the northwest and recurve later. Some storms which from during the first fortnight of May originate in the Andaman Sea and move either northwest or northeast causing heavy rainfall.

The winds, in the month of March, generally blow from the northeast, northwest and east directions and there are considerable number of calm days (wind speed 5.9 m.p.h.). In April the wind directions are more or less the same but with the gradual change of the pressure system more wind is found to move from the southwest and west and in May the predominant winds are from the west and southwest. The wind speed is high (8.6 m.p.h.) These features indicate the beginning of the southwest monsoon.

The Southwest Monsoon Season.

The monsoon breaks out over the islands by about the 20th May accompanied by thunder and rain. The rainfall gradually increases and reaches its peak in June at Port Blair, in August in Long Island and Mayabunder. Towards the end of the September, remnants of typhoons

10:Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2

132 of the China sea move across lower Burma and affect the North Andaman sea. The influence of these typhoons are particularly felt in the North Andaman.

In July, heavy falls of 15.85" have been recorded in 24 hours at Port Blair. The sky is overcast with clouds for days together. This appreciably reduces the temperature. The mean maximum temperature is 84.3°F and mean minimum temperature 75.0°F in July, the characteristic month of this season.

Post Southwest Monsoon Season.

This is the period of cyclonic disturbances. These cyclones of dangerous severity commence as feeble circulations and they have a progressive movement, with the stormfield advancing on a curved or sometimes a straight tract. The average velocity is about 200 to 300 miles per day. A general picture of the tropical cyclone is given below.

In front of a tropical cyclone the sky is covered with hight clouds in which halos sometimes appear. The air becomes sultry and oppressive; the wind falls almost to a calm and on the oceans a heavy swell rolls up. In the next stage, a breeze springs up, the clouds become lower and heavier and pressure begins to fall. Afterwards heavy rainclouds appear, first on the horizon and then advance across the sky; as the rain clouds pass overhead, the rain falls in torrents. The wind becomes fierce while barometer falls rapidly. High or tremendous seas are superimposed on the heavy swell. The sea sprays and rains destroy all visibility. When the wind has reached its greatest violence, suddenly the centre of the storm arrives. Here the wind suddenly drops from hurricane force to a light unsteady breeze, or sometimes to a complete calm. At the calm centre the lowest pressure is recorded and often there is a complete absence of low cloud and rains; the sun, moon and stars may be visible according to the time of day when the calm centre is traversed. Following the passage of the centre, the wind suddenly increases to hurricane force again but from the opposite direction; the torrential rain is renewed and barometer rises as quickly as it fell. As the end of the storm approaches, the wind falls and the rain clouds break and disappear leaving only the high clouds. Finally the wind drops, the sky clears and the pressure becomes normal. The average number of storms is about one per year. In November, the frequency of the storms that affect the area is about the same as in October and more than one in every two is likely to be severe.

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2

CLIMATIC REGIONS

It is difficult to divide the islands into climatic regions. The islands 132
having only a length of 192 miles and a width of 32 miles, when maximum, may bring out some changes in the climatic elements from north to south but little change from east to west. Whatever variation is found from east to west, is due to the presence of the north to south running hill systems.

If we consider the rainfall of the islands, it decreases as one goes towards the north and the east. The primary reason is the fact that the southwest monsoon causes heavy rainfall in the south and as it moves towards the north its rain bearing capacity decreases and ultimately causes less rainfall. Besides this the micro-climatic factors have important roles. The north-south system of hills evidently results in a greater rainfall in the west and more correctly on the windward side and an appreciable decrease in the leeward side. The northwestern monsoon as well, causes some rainfall in the northern and the eastern section of the islands. As such an increase in annual rainfall amount is experienced in the Table Island, situated in the northeast extremity of the North Andaman.

The temperature, as discussed previously, is almost the same in all the stations during the whole of the year.

Hence if any attempt is made for a division of the islands into climatic regions, the rainfall stands as the most important factor. As the islands have got only 4 stations, all of them having insufficient data[1] except Port Blair, which are all situated in the east coast of the Andamans, the successful division of the islands into climatic regions becomes impossible.

1. All the 3 stations except Port Blair.

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2

CHAPTER V
NATURAL VEGETATION

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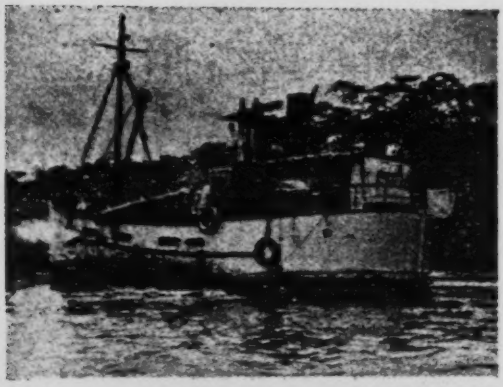

A timber carrying launch of the Andamans.

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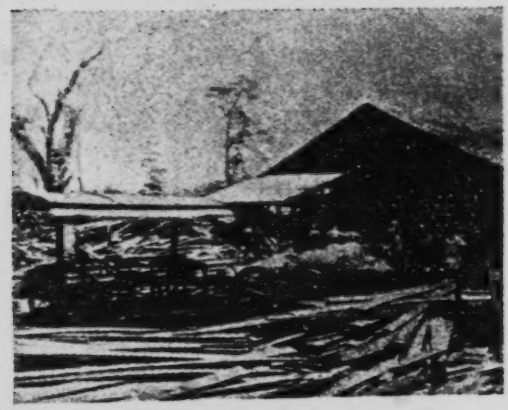

A view of the Saw Mill at Chatham Island.

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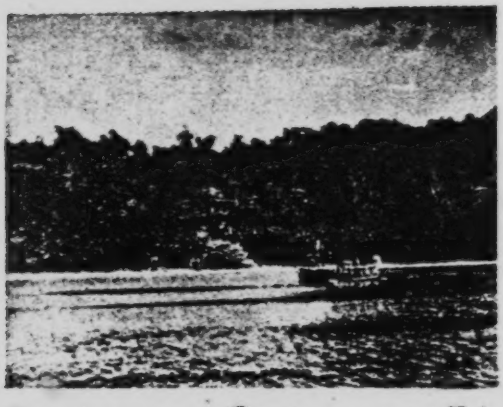

A view of the natural vegetation along the Sea coast.

[facing p. 36]

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2

CHAPTER V

NATURAL VEGETATION

137 "The Andamans present much variety in soil formation and there is accordingly a corresponding diversity of the vegetation."[1] The whole of the islands has an almost unbroken tropical type of forest. Unlike most of the countries, the islands have not been cleared of forests and still they occupy almost the whole of the islands except some areas around Port Blair in the South Andaman and a few other scattered spots. But the programme of settlement of the refugees from East Bengal and of some people from South India needs the clearance of forests[2] for providing rooms for settlement and the optimum amount that should be cleared for maintaining a perfect regional balance of the country is a highly controversial issue.

The general boatanical aspect of the islands is a deep cover of forests throughout the whole of the islands, the average height of the trees being 100′ ft. with straight stems and being covered in places entirely by creepers which hang from the top of the trees like festoons. Amongest these lianes the *Dinochala Tjangkorreh, Entada Purshaeta. Calamus and Dischidia nimmulia* have been recognised. There is an intense undergrowth of luxuriant plants making the forests impenetrable. It is observed by Mr. Kurz that the straight growth of the trees disappears, however, south of the South Corbyn's Cove and along the western coasts a more stunted vegetation occurs, the mean height of the vegetation being 80′ ft. Along the last named region, the trunk of the trees are bent showing some tendency of those trees to be in conformity with the direction of the southwest monsoon.

TYPES OF FORESTS

Depending upon the nature of topography, the soil and the availability of water, 3 main types of forests have developed in the Andaman Islands. They are

(a) The Evergreen Forest,
(b) The Deciduous Forest, and
(c) The Mangrove Forest.

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1. Kurz, S—Report on the vegetation of the Andaman Islands.
2. The clearance of forest is continuing for settlement in the Islands.

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2

The Evergreen forests are obviously concentrated in the regions of perennial water supply of water and therefore, are found in the moist valleys of the fresh water streams and also on the high hills as they experience relatively greater amount of rainfall. The principal trees are various species of Garjan (Dipterocarpus) associated with Black Chuglam (myristica irya), Lalchini (Calophyllum spectabile), Toungpeing (Artocarpus Chaplasha) etc. besides a number of minor species.

The Deciduous forests exist primarily on the lower and more gentle slopes of the hills. Padauk (Pterocarpus dalbergioides) forms the principal tree associated with Canarium euphyllum, Papita (Sterculia campanulata), Koko (Albizzia lebbek), Didu (Bombax Chaplasha), Pyimma (Lagerstreamia hypoleuca), White chuglam (terminalia bialata). Besides these few important species, a host of other types of trees are found in the islands but they are not so important from the point of view of revenue.

The Mangrove forests are widespread almost all along the coasts and especially along the estuaries of many creeks in a belt varying from a few yards to over a mile in width. As the creeks penetrate deep into the islands, the mangrove forests are also found to do so. The species of importance are Bruguiera gymnorhiza, Rhizophers Conjugata and Mucronata. The first one of them is of supreme importance which grow in pure stands. It attains a height of 70 to 80 feet and a girth of 5 feet.

Economic Value of the Forests of the Andamans.

The forest resources hold a key position in the list of the resources of the islands. The tropical vegetation inspite of its luxuriance, is generally much inferior to the temperate forests from the economic point of view. The absence of the growth of the different species in pure stands, the non-availability of the dense tropical vegetation, a sultry climate being incongenial for the tiresome and strainous labour required for lumbering operations and the great distance of the forest areas from the areas of consumption are the factors which have decisively proved the inferiority of the tropical forests. In many parts of the tropics, the forests being accessible and having good communication facilities, have paved the path for the development of the lumbering industry. Only because of these advantages the forests of the Caribbean Islands, Puerto Rico etc. have been virtually exhausted and many of the southeast Asian countries have started it at a very rapid pace.

The forests of the Andamans, in spite of their luxuriance, donot have very many valuable species though a few of them are useful for a large

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2

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number of purposes. The important species are padauk (Pterocarpus dalbergioides), garjan (Dipterocarpus spp), white dhup (Canarium euphyllum), papita (Sterculia campanulata) and the other ones of lesser importance are koko, white chuglam, lakuch, thingan, ywegi, lal bambwn, etc. A classification of the species according to their economic value and uses has been attempted below.

Class I type — Padauk, Koko, Chuglam, Marble wood and Satin wood.

Class II type — Pyimma, Bambwn, Chai Lakuch, Lakuch, Lalchini, Pongyet, Thitmin, Mowha, Khaya, Gangaw, Thingau.

Class III type—Didu, Ywegyi, Toungpeingyi and Garjan.

Of the class 1 woods, the padauk is of the most superior quality. Its average weight is 48 lbs. per cubic foot. It is a deep red wood, often with darker streaks, moderately hard and durable and seasons well and takes a fine polish. Some trees produce pale coloured wood, known in the trade as 'off colour' padauk which though good for construction purposes is of less value than the red padauk for ornamental use. Padauk is generally used for building boats, furniture, fine joinery and for all purposes to which teak,mahagany, hickory, oak and ash are applied. It is immuned from the attacks of white ants and borers, except the marine worm (toredo navalis) and form rats of all kinds.

The kako is of the colour of greenish grey or light brown or chocolate with dark markings with an average dry weight between 45-50 lbs. per cubic ft. It is not so hard and lustrous like padauk and as such is used in battons and furniture making.

The white and the black chuglams are of grey colour with darker markings. They are generally used for furniture, shafts and planking.

The marble or zebra wood is ebony with streaks of grey or light brown. It is used generally for furniture joinery makings.

The stain wood[1] is genearlly yellow in colour and it is soft and light. It is used for the manufacture of delicate furniture.

The Class II woods are used for a great variety of purposes. The pyimma is of considerable importance in the export list of the trees. The average dry weight is about 40 lbs. per cubic foot and is pale in colour, hard, durable and seasons well but swells when wet. It is largely used for building purposes specially as beams of the roof.

These informations were collected from the Forest Department, Andamans.

1. It is confused by many with the Sation Wood of Ceylon.

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2

The bombwn is the second most important type in the Class II type of woods. It has an averge weight of 40 lbs. per cubic ft. and is generally yellowish grey in colour with darker streaks. The durability of the wood is quite long but it cannot stand exposures. It is generally used for making of furniture and joineries. 137 313

The rest of the woods have also got an widespread application in a variety of purposes e.g. house building, shipmaking, carriage and furniture making. But the amount exploited from the forests is not of significance.

The didu and garjan are the most important in the class III type of woods. The former is of readdishy greay or yellowish in colour and is very soft and light. As such it is widely used in the making of packing cases for tea specially. The garjan is of the greatest demand of the Andaman forest woods. It has an average weight of 45-56 lbs. per cubic foot and is moderately hard. It is reddish grey to reddish brown in colour and is of moderate duration and as such the wood cannot be used for railway sleepers unless treated. It is used for planking and wood-paving now-a-days.

Ywegyi, being not a durable and hard type of wood, is generally used for the making of inferior cabinets. The trees yield a yellow dye which is also of wide use. [314]

Besides these, there are a host of other forest woods such as the several species of bamboo, cane, thatching palms etc. (For the industries based on forest products, see the Chapter on Industry.)

Forest Working.

The exploitation of timber from the forest has been attempted since the formation of the penal colony in the islands. For the systematic working of the forest, a Forest Department was opened in the year 1883 and a saw mill at Chatham was established in 1915 with a monthly outturn of 100 tons. But this was closed and another saw mill was set up by the Burma Trading Company having a monthly output of 750 tons and a second mill, an American circular mill in Chatham in 1927 and another mill in the North Andaman in 1925. But fortunately the wanton destruction of the forests was not possible because of the limited convict labour, and the fear of working in the aborigine-infested areas. The elephants were proved to be uneconomical in the exploitation of forest and an attempt for replacing the elephants by skidder was made in 1930. But the latter one was found to be uneconomical compared to the elephant power and this resulted again in the engagement of elephant 313 [492]

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2

313 492 power in the forests. The net revenue of the forests from 1869 amounted to Rs. 45,65,764 inclusive of a capital asset of Rs. 21,39,983.

313 The present day forest exploitation has to some extent been revitalised with the introduction of regenerating processes and use of disel engines for the trams carrying logs from the spot of exploitation to the jetty wherefrom it is carried down to Port Blair for sawing and finally exported to the mainland and London. The working of the forest in the Andamans and its preparation for marketing undergo a number of stages. After a proper survey, a spot of exploitation is selected where a forest camp is opened near the jetty with a sufficient strength of imported labourers from India. The forest camps are erected with local timber and the exploitation proceeds from the spot in the immediate neighbourhood of the jetty (exclusive of the mangrove forests) to the interior regions. Along with the expansion of the exploitation area, tram lines are laid down from the jetty onwards. The felling is done by chiselling the trunk of the trees and then it is pulled by a few elephants for breaking it down. This completes the felling of the tree and after properly cutting all the branches, the logs are carried by an elephant with the help of his trunk and are unloaded from the tram. Afterwards, it is taken to the jetty where 313 505 the logs are again unloaded and rafted in a tank-landing craft to make them ready for transportation to Chatham Island where it is shown into standard size (not always) and is exported to the markets. The transportation of the logs from the spot of exploitation to Port Blair is always done on water ways. The success in the transportation of the logs have been facilitated by the innumerable harbours and creeks making easy the passage of the boat into the interior parts of the islands and it is found that the average drag seldom exceeds a mile and at the same time exploitation requires some experience of local conditions and foresight, as the coastal areas are exposed to the open seas and advantage has to be taken of the different seasons of the year to work in different tracts.

313 433 The yield of merchantable timber is only 15 tons per acre. An assessment of the future potentialities of merchantable timber with the introduction of the present method of regeneration has been given by Sri Chengapa[1]. The sustained or perpetual yield of the forests is about 135,000 tons per year and according to him, with the introduction of the present method of regeneration, the yield per acre is expected to be as much as 75 tons per acre, a five fold increase of the present yield. The

[113] 1 Chengapa, B. S. — The Andaman forests and their development; Census of India, 1951, Volume XVII, Andaman & Nicobar Islands by A. K. Ghosh.

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2

approximate estimate of the output of the different types of timber is given below. 313 433

Annual yield — 675,000 tons,

Padauk — 7000 tons, Garjan — 28,0000 tons, White Dhup — 21,000 tons, Papita — 28,000 tons, Koko — 500 tons, White Chuglam — 7,000 tons, Black Chuglam — 2,500 tons, Pyinma — 1,500 tons, Badam — 11,000 tons, Didu — 7,000 tons and others — 14,000 tons.

Source: Chengapa, B. S.—The Andaman forests and their development; Census of India, 1951, Volume XVII, Andaman & Nicobar Islands by A. K. Ghosh.

The limitations in the exploitation of the forest resources of the Andamans are not few. The problems faced upto 1934-35 were primarily because of the inefficient methods in the extraction of timber and absence of due attention in the regeneration of the forests. Previously the exploitation was confined only to the coastal areas because of the easy accessibility, but the vast tracts of rich resources in the interior remained virtually untapped in the absence of any economic device. The construction of an experimental tramline in the Rangat valley, however, proved successful. The regeneration of the forests was also little cared for. The new plantations hardly exceeded 100 acres though the exploitation was widespread over large areas. Improvements in the line of regeneration were discernible since the year 1932 and marked improvements were brought about by the year 1936-37. According to this new device, the old crop is removed in two or more successive fellings allowing nature to do the sowing. 313 185

However, some of the limiting factors in the exploitation, transportation and marketing of the forest products are given below. 313 433

(1) The selection of the forests for exploitation is made from a very vague idea and proper surveys are hardly undertaken to realise the actual conditions in the fields which really happen to be quite different from theoretical speculations. It is found that many forests specially in the North Andaman are yet to be explored. Hence the insufficiency of knowledge regarding the forests has made the proper selections of the actual spots of exploitation an impossibility.

(2) The forest working in many regions have to be abandoned because of the seasonal water-supply.

(3) The trees in the forests do not occur in pure stands and hence random felling operations are done irrespective of the type of trees. It is estimated that the total wastage of timber in the Andaman forests is approximately 1 crore of rupees in value.

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2

313 (4) The amount of exploitation of timber in the Andamans reflects the nature of demand and its amount. The demand being highly elastic so long, the exploitation, in consequence, has suffered. The sale system of timber is far from satisfactory as the prices of the timbers are informed by the farms who buy them and on this basis the prices of the timbers are fixed and Sri Shivdasani writes[1] that "the purchasers themselves are the suppliers of information on which the department fixes the price. The effect of refusal to sell to anyone who wants the produce is to eliminate one of the main price determining factors i.e., extent of demand. The tendency of selected purchasers who become middlemen and pass on the timber to consumers after keeping a profit for themselves is to be more interested in buying those varieties of timber produced that have the best market. At the hands of the selected purchasers the marketing of Andaman timber cannot receive the attention required to ensure that as many categories as possible are sold. The interests and profit of the selected purchasers came first. Not only are they in a position to obtain disproportionate profit but the fixing of the price of such an important commodity being left to negotiations between one officer and interested purchasers is fraught with other dangers also."

(5) The problem of labour supply is also not satisfactory. Local labourers are not available because of their reluctance to do all these jobs. Labourers are to be brought from the mainland and they are either Ranchi or South Indian labourers.

The immediate steps that should be taken for the proper working of the forest are the fundamental change in the sale-system, addition of transports facilities from the Andamans to the mainland, formation of a permanent source of local labourers and proper surveys before the forests are worked. Regeneration of the forests have been introduced in recent times. The over importance given by the Forest Department to a few farms in the sale of Andaman timbers has led the department to be a tool in the hands of the farms. The sale of these timbers should be made to any farm found suitable by the Forest Department after proper consideration and the fixation of the price should also be determined by the department.

Unless the transportation facilities of timbers from the islands to the mainland are increased, the amount of forest working can hardly

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1 Shivdasani, H. R.—Report on the possibilities of Colonization and development of the Andaman and Nicobar Islands, 1949.

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2

be accelerated. It is believed that the demand for timber in the mainland is so much that it can easily absorb as much timber as the islands can produce. The transportation problem, is one of the, if not, the most important limiting factor in the amount of forest exploitation. In this connection, it may be recalled that the Forest Department can hardly cope with the forest clearance as well as find a market for the timber in the recent colonisation scheme in the country. These are obviously due to the scarcity of labour supply, shortage of elephant power, labour supply and transportation facilities.

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CHAPTER VI

SOILS

134 Soil is the unconsolidated material on the surface of the earth. The origin of the soils has been attributed to different factors and in the early days, it was a common belief that the soil is the outcome of the disintegration of the parent material. As such, the soils were believed to be very much akin to the parent material. However, the concept of soil formation has been thoroughly revolutionised by the Russian pedologist, Dokucahev in 1879 and afterwards developed by Sibirtsev in 1901, Glinka in 1914 and other Russian scientists. Dokuchaev was the first pedologist to propound the theory that a given parent material may form different soils depending upon the environmental conditions.

Soil Forming Factors

The most decisive factor regarding the distribution of soil types has been attributed neither to the parent material nor to the climatic conditions, but due to combined effects of climate, micro-organisms, topography, parent material and time, of which the first one is the most dominating factor according to the celebrated pedologist, Glinka.

According to Lang, the soil may be arranged in relation to the rain factor. So far the Andamans are concerned, the temperature does not show any appreciable regional variation but the rainfall does so. In the Andamans, the gradual decrease in rainfall is experienced as one goes from west to east and from south to north (For details see the Chapter on Climate). Besides this, the variation in rainfall is marked in a small area because of the juxtaposition of high lands and valleys. Under such conditions, the division of the Andamans into different soil regions is extremely difficult unless a detailed soil survey for the islands is undertaken. With the existing knowledge, the soils of the Andamans can be broadly divided into three types.

1. Soil of the hilly region.
2. Soil of the valley region..
3. Soil of the coastal region.

Soil of the Hilly Region

These regions are characterised by hot and humid climate. The soil is low in organic matter, strongly leached, rich in clay, and more or

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2

less yellow in colour. The texture (by feel) is clayey. But from the few soil samples, collected by the author, a generalisation will be far from satisfactory. Generally brick coloured soils are found over the serpentine rocks e.g. in the Saddle Peak area, Rutland and parts of Mount Harriet Range. The brick colour is evidently due to excessive leaching and consequent increase of the Fe-Al content. 134

Soil of the Valley Region

The samples of the valley region were taken from Dhani Khari area in the South Andaman and the Rangat area in the Middle Andaman. The texture (by feel) is clayey having more than 50% clay. It is rich in silica. The structure is more or less of platty type. The greyish or blackish soils with considerable quantity of siliceous materials are found covering the indurated chloritic or greenstone rocks in the Middle Andaman.

Soil of the Coastal Region

There are deep penetrations of creeks of the sea into the land giving rise to the mangrove swamps (c.f. Sunderbans). It is highly saline in character giving rise to halophytic types of vegetation. The texture of the soil is coarse.

Soil Erosion

In general, the soil cover of the Andamans is not very thick (4") which is highly susceptible to erosion due to the undulating nature of topography and high rainfall. Vast tracts of forest areas are being cleared for the settlement of refugees from East Pakistan and the menace of soil erosion has shown its early indications. For a continued upkeep of the fertility of the soils, the menace of the soil erosion should be checked by careful clearance and regeneration of the forests and also by proper agricultural devices.

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2

CHAPTER VII

MINERAL RESOURCES

135 The mineral resources in the Andamans were believed to be bountiful. There had been mentions in the earlier notes of many travellers and historians (e.g. Nicolo Conti) about the richness of the islands in gold and they have gone so far as to call these islands as the "Island of Gold". But unfortunately no gold has yet been found in the Andamans nor is there any reason to suppose that it will be found. In this [648] connection it may be recalled that Dr. Helfer, a Russian Geologist was killed by the aborigines while he was making geological prospecting in search of gold. M. V. Portman discovered specimens of various minerals in the neighbourhood of Port Blair and they are chromium, copper, iron and sulphur. As such the land seemed to be sufficiently promising and Mr. Mallet[1] proceeded to Port Blair for further investigations. But unfortunately no important deposit of any mineral has been found to occur except some nests of lignite and bands of pure limestone in scattered places and in the serpentine rocks specially in the northeast part of Rutland occur small crystals of bronzite.

A few miles south of Port Blair near about Rangachang, highly altered and eruptive rocks are found being traversed by veins, the main constituent of which is hematite, but which consist of a considerable portion of pyrite (iron pyrites) and chalcopyrite (copper pyrite) in much smaller quantity.

Of the above-mentioned minerals, none are found to be economically exploitable. It has been argued that the Andamans cannot be rich in minerals because the Arakan Yoma of Burma also shows a barrenness in minerals and the only ores which need be noticed for practical purposes are those of tin, iron, lead, copper, antimony, none of which save iron, are known west of Sittang. But the apparent barrenness of the Arakan hills, however, can not be taken as conclusively proving that the Andamans are equally unproductive. It is believed that the Japanese carried out a full mineral survey of the islands and are reported to have found deposits including coal, iron and precious stones.

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[113] 1. Mallet, F. L. On some of the mineral resources of the Andaman Islands in the neighbourhood of Port Blair, Rec. G.S.I. Vol. XVII, 1884.

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2

Coal:

It is of very poor quality and occurs in pockets in the sandstones, associated with poorly preserved leaf impressions. No sign of continuous seam has been observed in the islands. The coal deposits of the islands are of the same age as the coal bearing strata of Beluchistan. But unfortunately no coal is economically exploitable. 135

Under such circumstances of poor knowledge regarding the minerals of the islands, nothing can be said regarding the future mineral position of the islands. Immediate measures should be taken for the proper mineral investigation of the islands for future programmes of setting up industries.

[pp 48-50 contain no text material]

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2

[P 51]

CHAPTER VIII

THE PEOPLE

The study of the people of the Andamans is rendered extremely interesting by virtue of the great diversities in the types of population. Obviously for the islands like the Andamans the diversities of population are far out of proportion. The islands remained as an abode of the aborigines, the negritoes, in complete seclusion and the only outside interference that had tampered the islands were the occasional raids by the sea pirates from Malaya. The beliefs about the occasional exchanges of commodities and ideas of the pirates with the Andamanese and the trade of the Andamanese for being sold as slaves in the courts of Siam and Cambodia are still now questions of doubt. However, it was only at the end of the 18th century, with the attempt of the formation of settlements and later on, of the penal settlement, that there began an influx of foreign peoples, mainly from the different parts of the mainland of India. With the formation of the penal colony, convicts were brought over to the islands in numbers and also a few attempts of free colonisation by some people from Burma and India were made. The convicts who were from the different parts of India and the free colonizors who were diverse enough in their social and cultural traits gave a character of heterogeneity to the islands. It was only after the attainment of the independence that the settlement of the East Bengal refugees and of some people from South India is taking place in the Andamans. This is going to add further to the cultural diversity of the islands. This scheme of colonisation of the East Bengal refugees and of some people from South India is the first attempt of some importance for the permanent colonization in the islands.

Such a variety in the types of people, can be broadly divided into three groups.

(a) The aboriginal population.
(b) The Later Settlers, and
(c) The New Settlers.

The aboriginal population belongs to the negrito stock and therefore, has an affinity with the Semangs and Sakais of Malaya, the Veddas of Ceylon and the other negrito groups of Southeast Asia. Some attribute the origin of these aborigines to the settlement of some Portuguese negro slaves who had survived by coming to these islands after a ship-

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2

174 wreck. However, this idea is totally untenable. On the other hand
101 there are sufficient grounds to believe that these aborigines came down from the lower region of Burma. On their arrival at the islands, they moved to the different parts of the islands and very likely, because of the different types of physical environment they developed different traits and as such a few groups of the population are discernible. They are the

(a) The Jarawas,
(b) " Onges,
(c) " Andamanese, and
(d) " Sentinelese.

101 All these groups, though physically akin to each other, have deve-
131 loped different social and economic traits and the ways of earning their food and constructing their shelters are conditioned by their immediate environment. These aborigines who had spread over the different parts of the Great Andamans are experiencing a gradual shrinkage in their areas of command because of the gradual expansion of the areas of the new settlers. The Jarawas are to-day confined to the western part of the South and Middle Andaman, the Andamanese, who are extremely limited in number are along the coastal areas, the Onges in the Little Andaman and Rutland Is. and the Sentinelese in the Sentinel islands. The relation of aborigines with the foreign people became one of deep distrust and hostility with some of the groups, especially the Jarawas and the Sentinelese, which has been very rightly explained by M. V. Portman as an outcome of the unfriendly attitude of the foreigners. The Onges and the Andamanese have however become very friendly with the foreigners. The number of the aboriginal population of the Andamans, is undoubtedly a matter of considerable speculation and it is more so in the case of the Jarawas and the Sentinelese whereas, for the Onges and the Andamanese the estimate is fairly correct.

161 The aboriginal population of the Andamans is fast declining in number and there is apprehension that inspite of the best of attempts, the chances of the survival of the aborigines for long ages are extremely limited. Undoubtedly, the aboriginal population of the Andamans is an object of interesting study. Such an interest grows out of its being the only purest negrito group in the world and the modes of their life depict very well the nature of symbiotic relationship existing between
[178] man and environment. Such a primitive economy of hunting and collecting has not changed appreciably inspite of the impact with the foreigners except imbibing some foreign vices.

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2

The formation of the penal colony in the islands brought in a number 563
of convicts from time to time to serve death sentence or life sentence because of the political or criminal offence and majority of the convicts had ultimately settled in the islands and at present they have got mixed up irrespective of the caste, creed and religion with a fair degree of homogeneity. They are known as Andaman Indians. Besides these Andaman Indians, the groups of Karens and Burmans constitute a very small percentage of the Burmese population in the islands who foster their indigenous traditions. The need for land for the rehabilitation of the refugees in India due to the partition has made from for the settlement of some refugees in the islands. As the settlement programme of these refugees and also of some people from South India demanded the search for suitable land for colonization of the people, a number of delegations had explored the possibilities. The islands with the extreme smallness in size can hardly make room for the lakhs of refugees but the limited settlement that has been established has definitely provided some of the unfortunates with a small plot of land to live on. This idea of colonization is unique in the settlement history of the islands as we do not find in the earlier periods such an attempt for permanent colonization except by some people from Burma. So long, the permanent settlements grew out of the settlement of the free convicts and in most cases under compulsion. The settlement of the later settlers was so long confined within the South Andaman only and especially around Port Blair. But this colonization scheme which has started operating since March, 1949 is throwing open the different parts of the islands for permanent settlement.

As the aboriginal population and the later settlers are the determi- 128
nants of the dynamism of the islands, three separate chapters are added. The first chapter is devoted to the study of the aboriginal population and the other ones, to that of the later settlers and new settlers.

[The two chapters on the later settlers and the new settlers haven't been processed. -Analyst]

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2
Onge
Andamanese

A group of Onges

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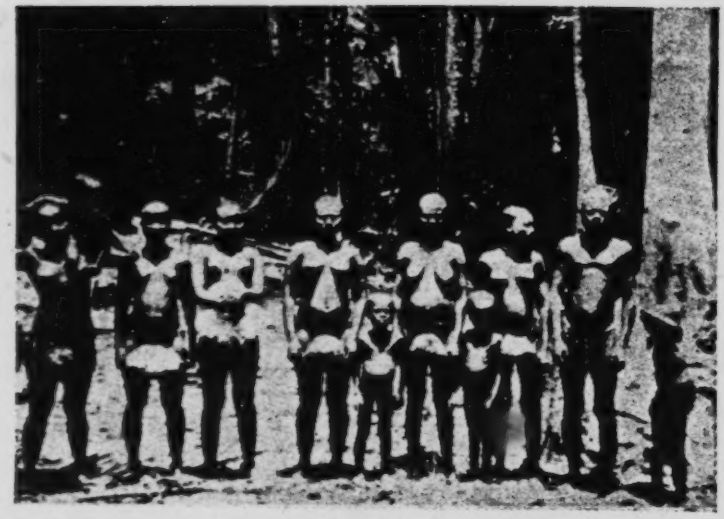

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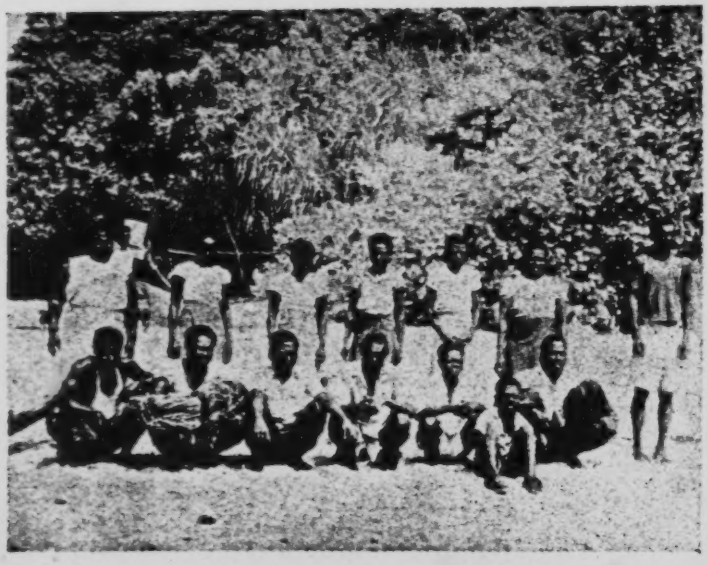

A group of Andamanese (Courtesy A. S. I.)

[facing P. 54]

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2
Negritos

CHAPTER IX

ABORIGINAL POPULATION

144 As said earlier, the aboriginal population of the Andamans belong to the negrito group which is spread over the different parts of Southeast Asia e.g. the Semangs and Sakais of Malaya, the Veddas of Ceylon, the Tapiro of New Guinea etc. The pygmies of the Equatorial Africa also show very close resemblance to the negritoes in physical as well as cultural characteristics but the latter are taller, much more dark skinned and also hairy than the former. In spite of the racial affinity with the other negrito groups of Southeast Asia, the Andamanese show a remarkable degree of purity, an outcome of the virtual seclusion and little contact with the other people. But the infiltration of the later settlers have proved a long way to bring about some changes in them. The comparison of the Andamanese with the other negritoes will prove that a good deal of evolution of the Andamanese has been attained by them independently.

Affinity with the other Negritoes of Southeast Asia

171 Though the fundamantals of the economy of the Andamanese do not differ appreciably from the Semangs and the other groups, some characteristic features distinguish these people from the others. The Andamanese follows a long series of food privations which is absent among the Semangs and the equipments are also more elaborate than [50] the other negritoes. The outrigger canoes of the Andamanese are more improved, the bows are of complicated S-form and the huts are considerable improvements of the rudimentary temporary camps original to the negritoes. These indicate a definite improvement of the material culture of the Andamanese over the others.

The affinity of the Andamanese with the other negrito groups i.e. the Semangs of the Malaya Peninsula and the Aetas of the Philippines can very well be traced from the study of the equipments of material culture and also from the general habits and the methods of life.

171 As regards the equipments, the bow, the arrow, the mode of erecting 411 shelter and its shape show further improvements in their constuction though the prevalence of the original simple types can be detected in some parts. The original one curvature bow has considerably evolved and has developed into the S-shaped bow in the Andamans though the

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2
Negritos

original type can still be found in the Little Andaman. The similarity of the arrows are also striking and this has been rightly observed by Dr. Cipriani,[1] 'Similarity also with the arrows. This consists of a barbed detachable head connected to the shaft by a string. The harpoon arrow like its near relative and probable forefather, the harpoon spears, offers an interesting question in ethnography. Although the Andamans are widely separated from Malaya and Malaya from the Philippines, the three groups of negritoes have harpoon arrows, while such weapons do not seem to be present in other regions of Asia.' The huts of the Andamanese are also the outcome of further improvements over the original negrito shelter found among the other negrito groups.

In the general habits and the modes of living, a good deal of similarity if not identity is maintained with the other negritoes. But changes and modifications have crept up among the different groups in response to the different environments. Some of the original habits have been totally forgotten and some equipments have been further improved upon or in some cases, totally forgotten. The Jarawas, who are believed to have arrived in the Great Andamans from the South had the knowledge of construction and use of the canoes which served as the means of their movement from the south to the north, have totally forgotten both the construction and use of it.

Though the changes brought about among the Andamanese in response to the environment and time is in no way inconsiderable to give them an impress of individuality, little room for doubt is left that they belong to the big family of the negritoes whose remnants are only found to-day scattered over the different parts of southeast Asia.

Origin of the Andamanese

The presence of such a small group of negritoes in the deep solitude of physical separation from the other countries obviously arouses the question as to how and wherefrom they came. The attributes of the Andamanese, prove very well their affinity with the negrito groups. Much to the curiosity of the observers, the tribal people of the Nicobar Islands do not show any affinity with the Andamanese culturally or materially and such contrasts are important aspects of anthropological study. However, the distribution of the negrito group in these isolated islands have been explained by some as the passage of the people from the Lower reaches of Burma and it is accepted with greater unanimity be-

1 Cipriani, L—On the origin of the Andamanese, Andaman & Nicobar Islands, Census of India, 1961.

[113]

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2
Negritos

174 cause of reasonable grounds. In this search for the origin, some one has gone so far as to advocate a shipwreck of Portuguese Negro slaves whose survivors ultimately became the Andamanese. A number of theories about the origin of the Andamanese have been put forward by the different authorities.

The idea of the shipwreck and the survival of the Portuguese Negro slaves can be discarded forthwith. The negroes of Africa, though physically very much akin to the Andamanese, present appreciable differences and secondly the date of arrival of the Portuguese in the Indian Ocean was 'only after the circumnavigation of the Cape of Good Hope, this would mean their coming sometime after the 15th Century, allowing not more than 500 years for the existence of the supposed shipwreck in the Andaman islands. The objections are 'great differences physi-
172 cally and materially from the people of Africa. Kitchen middens date
174 back to milleniums i.e. long before the arrival of the Portuguese anywhere in Asia.'[1]

One of the very good clues for ascertaining the date of arrival of the Andamanese has been pointed out by Dr. Cipriani and he has conducted such a study in some parts of the Little Andaman and the Great Andamans. It is the study of the kitchen middens, that is, the accumulations of refuse, mostly of kitchen. Kitchen middens are fairly widespread and they are obviously the relics of a group of persons living in one spot. The kitchen middens, as they constitute the refuse of a group of persons, consist mostly of empty shells, nearly all bivalve, thrown after the contents have been eaten. The age of the kitchen midden can be calculated by counting the number of shells and the number that can be eaten by a person in one day. Cipriani writes that, 'Considering how many shells can be eaten everyday by one person and estimating the number of persons, that through the ages constituted to the formation of the deposit, it is possible to calculate the age of the kitchen middens, After the studies carried on the Onges we may say that every kitchen midden is formed as a result of the activities of a small group of some 30 to 40 persons who may frequent the spot for 40 to 50 days in a year. Their food is rarely formed of molluscs, they resort to these only when there is nothing to eat..... In this way many of the Andamanese accumulations, often huge, required a long period for their formation, a period to be calculated in thousands of years. Even if we reduce this number to half, the resulting antiquity

1 Ciprini, L—On the origin of the Andamanese, etc.

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2
Negritos

is not in accordance with the opinion that the Andamanese are descendants of shipwrecked Portuguese Negro slaves.' Though this process seems to be very crude for the determination of the exact date of the arrival of the Andamanese, a rough guess can very well be made. Cipriani has also advocated the measurement of the residual radioactivity of charcoal at different levels for the determination of the antiquity of the Andamanese. It is quite obvious that further research in these lines in the future can only give us a more precise idea about the date of the arrival of the aborigines.

The region wherefrom the aborigines arrived and the route of their migration are also matters of considerable controversy. It is believed that the Andaman and Nicobar islands were connected by land with the Arakan folds of Burma in the late Tertiary period, but this is also not very certain. According to Brown, the authority on the anthropology of the Andamans, the negritoes migrated from the Arakan region of Burma if there had been any land connection and if not, they migrated, not by land, but by sea from the Burmese coast (Pegu or Arakan). Brown says, 'The N. E. Monsoon could drift them thence on to the Andamans. It is conceivable that they might have travelled from Sumatra by the way of the Nicobars but the N. E. Monsoon would have appeased their progress in this direction while the S. W. Monsoon would have driven them to the coast of the Andamans. It is hardly possible to imagine them coming from the Malaya Peninsula across the wide stretch of the Andaman Sea. The balance of possibility is in favour of the view that the Andamans were peopled either by land or by sea, from the region of the Lower Burma.'[1] It is probable that the negritoes moved from Burma either at a time when a direct land connection was achieved or when shallow waters in the sea facilitated movement by the rafts of the aborigines, but the former has been considered to be thoroughly untenable because of the absence of any mammalia in the Andamans and this proves that if at all there had been any land connection of Burma and Andamans, it must have been before the evolution of the mammalia. The deep sea researches of Molengraaf (1921) have been utilised by Kaudern (1939)[2] to interpret the probable routes of migration of the negritoes into the Andaman Islands. In the Quaternary period, there had been alternating glacial and interglacial periods because of the

1 Brown, A. R—The Andaman Islands.

2 Kaudern, W—Notes on the geographical distribution of the pygmies and their possible afflicties; Etno. Stud. g, 1939.

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2
Negritos

174 change of the climate. In the glacial period, there had been a fall in
133 the level of the sea because of the fact that a great volume of water of the sea had transformed into ice. Hence in one such glacial period, as believed by Kaudern, there was a fall of 300 metres in the sea-level which established a direct contact with Burma facilitating the movement of the negritoes into the islands. But the absence of the Negrito group in the Nicobar Islands, only about 100 miles off the Andamans, invokes inquiry. This conspicuous absence of the negritoes in the Nicobars has been explained by Kaudern in this way:

'If the pygmies, when they migrated from the continent towards the south, were able to reach the former (the Andamans) but not the latter islands (the Nicobars), it meant that there has been at some time a fall of sea level of nearly 300 metres, but not as much as 800 metres in these tracts,[1] As the Ten Degree channel exists between the Andamans and the Nicobars, the movement of the Negritoes further south was stopped.

174 There has been an attempt of linking up some of the tales of Hindu Mythology, Ramayana with the land and people of the Andamans. Detection of such a link has been speculated in search of the origin of the aboriginal population. Though there is no room for doubt of the affinity of the aborigines of the Andamans with the negritoes, as established from the studies of the physical and cultural anthropology, Shri S. K. Gupta, though not an anthropologist, has been a strong advocate of the opinion that the aborigines of the Andamans are the 'kiratas' of Ramayana. He writes, 'According to modern anthropology they are of the negrito stock. But according to Ramayana they are kiratas. These kiratas have been described in our literature as shiny black, with a copper coloured head of hair (Tamramurdhaja), bulging eyes, strong teeth. The description recorded several thousands years ago, holds good to-day All these tribes have copper coloured curly short hair growing as it were in separate insulated tufts."[2] Further knowledge about them is that they live on meat and fish.

The affinity of the Andamanese has been further confirmed by citing some native appellations of the Andamanese which show a striking phonetical similarity to those of the kiratas e.g., *Aka-kora* (*da*). *Aka-kede* (*da*), *Aka-kol* (*da*) etc and also the phonetical similarity of the Onge word *Boan* with Santal word *Bonga* both signifying God.

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[113] 1 Kaudern, W—Notes on the geographical distribution of the pygmies etc, Etno. Stud. 9, 1939.

2 Gupta, S. K—Andaman & Nicobar Islands, 1951.

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2
Negritos

Sri Gupta, in conclusion, has been tempted to emphasise with firm conviction that the Andamanese are, therefore, very probably a remnant of the dwellers on the marshes of Bengal and the uplands of Santhal Paragana or the dense forests of Burma and Malaya. 174

As regards the native appellations and phonetic similarity, such apparent similarity is possibly evidenced in many groups separated from each other by long distances. Similarly, the diet of raw meat and fish is and was common to all hunting and collecting tribes of the world. Independent evolution of many tribes has been akin to each other and therefore, the further geological studies and studies in anthropology can only confirm the idea.

Since the arrival of the Andamanese in the islands, a gradual separation has taken place among the different branches of population who had moved to different parts of the islands. The micro-environment has exerted considerable influence in moulding these people ultimately giving birth to a number of sub-groups. However, the broad generalisations are their hunting and collecting economy, complete ignorance about the domestication of the plants and the animals, except the Onges who have learnt only for the last 30 years the domestication of dogs. Family is the smallest social unit and a few families constitute the communal hut. Each tribal sub-group has its hunting territory, within which it maintains a more or less nomadic life till they return to the main settlement where they have a communal hut. 105 174 [592] [423]

The doctrine of the environmental determinism exemplifies itself in the adaptation of the aborigines to the local environment. In their life, they never look beyond their local geography and the materials for houses, the food, the ornaments and every thing that they are in need of, are collected from the small territory in which a community lives. So the obvious conclusion may be drawn that the coastal tribes are dependent on fishing, turtle hunting and gathering of shells and oysters and the interior tribes on hunting. This type of primitive economy, based on hunting and collecting, cannot support more than two to four persons per square mile as against more than 300 per square mile in agricultural lands and again the density varies to a great extent according to the type of agriculture practised e.g., rice-growing regions support the maximum density of population. In spite of their all-round self-sufficiency they have some connections with the later settlers. For the want of iron, tobacco, distilled liquor, opium etc., these aborigines (jarawas) either make periodic raids on the settlements (Onges and Andamanese) or have established friendly relations with the settlers. The necessity 105 105 177 439

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2
Negritos

An outrigger Canoe. (Courtesy A. S. I.)

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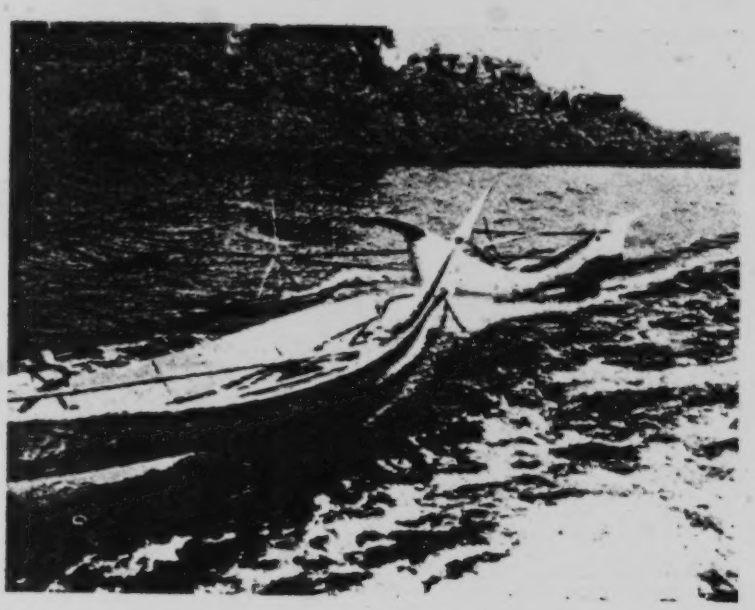
[133]



An outrigger Canoe with a Burmese Boat (Courtesy A. S. I.)

[facing P. 60]

10:Sen K-3,4 (ca. 1955) 1962 AZ2 Andamans AZ2
Negritos

105 177 439 of all these things, locally not available, was felt by the aborigines only due to their slight contact with the later settlers.

However, a broad two-fold division of the aboriginal population can be made.

101 174

1. Aborigines of the Great Andaman Group — All the aborigines of the Great Andamans with the exception of the Jarawas, the most hostile aborigines living in the southwestern part of the Andamans.

2. Aborigines of the Little Andaman Group — the Onges of the Little Andaman, the Jarawas of the South Andaman & the Sentinelese of the North Sentinel island.

As to how these two groups came into being and their areas of distribution, various theories have been put forward. Long after the attainment of the individual traits of these two groups, a continuous northward movement of the aborigines from the Little Andaman was in vogue and one such party had arrived in the Great Andamans who have been lately known as the Jarawas, who were all along subjected to pressure of the local natives belonging to the Great Andaman Group, the *Aka bea* of South Andaman. The very development of the hostility of the Jarawas and their complete seclusion from the other aboriginal groups owe to their being continuously subjected to the adversities. B. V. Eickstedt[1] has been of the opinion that the aborigines of the Andamans entered into the Great Andamans in two groups—the earlier group comprises the Onge, Jarawas and the Sentinelese while to the later group belong the ancestors of the Great Andaman Group. The passage of the Great Andaman Group has led to a constant southward push of the earlier group which has ultimately led to their habitation in the islands of the south i.e., the Little Andaman, Rutland Island and a part of the South Andaman. Cipriani has been emphatic enough in justifying the views of Brown that the Jarawas reached the Great Andamans from the south. Though they are supposed to have come from the Great Andamans by canoes, the art of constructing canoes and of using them have been completely forgotten and Cipriani believes that such instances of the loss of knowledge of the construction of canoes and their uses are many. A list of the names of the camps, given by Cipriani in the 1951 census, dating back to antiquity and having a good supply of drinking water and of

101 174 182 501

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1 Eickstedt, B. V — Die Negrite der Andaman (Anthro Ans).

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2
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food lie in a chain running from north to south along the islands between Little and Great Andamans. This has been one of the most convincing proofs of the movement of the aborigines from the south to the north. Cipriani writes, 'All these organisations, with geographical names, camps, places for water and food, indicate an ancient navigating experience moving from the south to the north. About a century and half ago the Jarawas are said to have still been in possession of canoes and the same is said of the savage inhabitants of the North Sentinel Island less than 50 years ago. In a surprisingly short period the technique of making canoes seems to have been completely forgotten as a result of the difficulties of using them."

THE ABORIGINES OF THE GREAT ANDAMAN GROUP

Andamanese, as they are called, were the most widespread and the largest in number. They had split up ultimately into a few sub-groups from the north to the south. The different groups are *Aka-kora, Aka-boa, Aka-jeru and Aka-bea.* There has been a deplorable decline in the number of these aborigines who in the bygone ages exceeded all other groups in number. At present the number is only 23, a considerable reduction from the number 625 only in the beginning of the 20th century. Though the present importance of the Andamanese because of the extremely poor number is far from significant, they are of no small interest for the study of the anthropologist, especially the impact of these people with the later settlers.

The consequences of the impact of the outsiders on the Andamanese have been far from satisfactory. With the formation of the penal colony, the aborigines continued to develop feud and on the 14th of May, 1959 a clash between the aborigines and the Govt. occurred which is known as the Battle of Aberdeen. Aberdeen is at the heart of the town of Port Blair. Efforts of pacifying these aborigines were made and for bringing them into closer terms of amity, the 'Andamanese Home' was started in 1863 by Rev. H. Corbyn Chaplain. They were employed for working with the convicts taught to speak English and wear clothes. The consequence of such an impact has been alarmingly devastating because of the infiltration of a number of vices and diseases which only paved the way for their impoverishment and decay (For further particulars see demographic characteristics).

2 Cipriani, L — On the origin of the Andamanese, Andaman & Nicobar Islands, Census of India, 1951.

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2
Onge

CHAPTER IX
ABORIGINAL POPULATION

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Communal dinner of the Onges (Courtesy A. S. I.)

[facing P. 62.]

10:Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2
Negritos

105 177 182 [225] [481] For the fact that the Andamanese inhabits the coastal areas of the Andamans, the fishing is an well-known art to them. The pristine culture is virtually lost and the few who are still now surviving have been brought under the folds of government help. Still now the headmen of the Andamanese in the Middle Andaman, *Loka* is found doing turtle hunting in their canoes and climbing up the coconut trees without the help of any rope. Still now they are found dancing in groups but they are few and far between. All of them wear clothes and live in the huts made by the Forest Department.

THE ABORIGINES OF THE LITTLE ANDAMAN GROUP.

101 The Onges, the Jarawas and the Sentinelese belong to this group.

The Jarawas

177 648 [101] [181] Of all these three groups, the Jarawas only live in the Great Andamans and their occurrence in the Great Andamans has been explained by many authorities, as has been explained earlier. The Jarawas are implacably hostile and the best of efforts to bring them under terms of amity have proved furtile. Lt. Colebrook and Archibald Blair first came in contact with the Jarawas and in course of time, the Aka-beas, belonging to the Great Andaman Group, living in the South Andaman became friendly with the foreigners while the hostility of the Jarawas remained unabated. The Jarawa hostility has been always increasing and it was more so since 1921. In 1923, 37 Jarawas were shot and in 1938, a Jarawa woman and her 4 children were captured. So the chances of meeting the Jarawas have been few and far between and the great decline in their number has in all practical senses stopped the apprehension of their raids in the new settlement areas. Still now, of course a person penetrating deep into the forests of the eastern parts of South Andaman should always be on the guard against an attack from the Jarawas.

The Onges.

The Onges, having experienced the impact of the foreigners at the latest period, are at present the most widesprend of all the aborigines of the Andamans. They do not have the truculence of the Jarawas and the attempts for bringing them under closer ties and terms of amity with the foreigners have proved successful, though the essential traits of their social, cultural and material life remain unaltered.

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2
Onge

The contact of the Onges with the outsiders can only be traced since the efforts of M. V. Portman[1] to establish a friendly relation with these tribes from 1886 onwards. However the earlier contacts with the Chinese and Japanese were possible because these people used to frequent the shores of Little Andaman for collecting the valuable shells and the Onges used to be engaged by them as divers and in reciprocation they were given presents of alcohol and opium. In the initial stage of the attempt for establishing a friendly relation by Portman, the Onges proved themselves hostile which was evidenced from the poor fate of the crews of a ship 'Assam Valley' when it touched the shores of Little Andaman and it was through the great efforts of the punitive expedition led by W. L. Much that the dead bodies of the crews were recovered. Later on, a few Onges, all on a sudden, arrived at Cinque Island and were captured by M. V. Portman. Only 9 of them were detained and the rest 15 were released. These few captured Onges were closely observed and studied in Port Blair by Portman and were ultimately returned back to their native land, Little Andaman. The friendly treatment and the presents that these Onges had received from Portman, paved the path of establishing friendly relations with the Onges much easier and also made the subsequent visits of the foreigners much more welcome. After Portman, a few more contacts were made with the Onges by Prof. Lapicque in March, 1893, during the operations of 1911 and 1921, undertaken by Eicsktedt, a German anthropologist, in 1827, by Dr. B. S. Guha, Ex-Director Anthropological Survey of India in 1948 and by Lidio Cipriani, an Italian anthropologist in the year 1954 and in a few succeeding years. Still the knowledge about the Onges seems to be meagre.

Living exclusively in the Little Andaman and a few of them in the Rutland Island, the Onges live in groups on a septal basis with clear-cut boundaries of hunting group for each group. There is no permanent habitation or village of the Onges in any part of the Little Andaman and their huts are of two types—(a) the permanent type of communal hut called *bera*, and (b) the temporary type of shelter called *korale*.

The abundance of food and water has made the life of the Onges comparatively easy-going. All the groups are headed by a leader and each group is assigned a fixed territory. The community life seems to be extremely democratic in character which entertains and also maintains a perfect individual freedom and only in times of necessity, advice,

1 Portman, M. V—History of one relations with the Andamanese.

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Painted faces of the Onges (Courtesy A.S.I)

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Preparation of a tussel by an Onge Woman (Courtesy A.S.I.)

Construction of the hut by an Onges (Courtesy A.S.I.)

[facing p. 64]

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621 rather than order is given by the leader. Cipriani observes.[1] "For
622 instance, it is very amusing for them to think that a man gives orders to others. This means that they have no real chiefs. A so-called Onge
[592] chief, or raja, is only the head of a group of families living in the same communal hut, and giving not orders but only advice. It is the most experienced man who is considered chief in the hut, but his authority if at all never goes beyond that hut. In other words no real chief exists in the Little Andaman. Notwithstanding this, there is a perfect order in the island, because nobody interferes with the work or encroches upon what can be considered the rights of others."

124 As is common to most of the aborigines, the Onges are generally
162 not very receptive when the questions about their numbers and other groups are enquired. The headman says that there are many many fifty Onges. However the number of the Onges are approximately 600.

22 As regards the mode of living of the Onges, the hunting and collec-
231 ting are the basis of their economy. The domestication of the plants
241 i.e. art of agriculture is not known to them and it is only 30 years back, the dogs arrived in the island and have been domesticated by the Onges for chasing the pigs, their main prey. In the absence of agriculture, the natural products of the sea and the forest provide them with all
[262] their items of diet. Animal and vegetable products and honey are the main items of their diet and there has been, so far, no introduction of salt in their diet. The most important victims of their hunting are pigs and turtles, the former is chased by dogs and are killed with great
252 cruelty. The cooking of the fish, meat, roots, tubers, jackfruits etc are
251 done by putting them under fire. Preservation of foodstuffs is not widely practised except the jackfruit seeds which are tied up in a small net inside water on the bank of some stream and taken out during rainy season, when the other vegetable foodstuffs are not available. On
146 the whole, the Onges have a very balanced diet with a fair richness of all the nutrients. In this connection the observations of Dr. Cipriani during his survey in the Little Andaman throws considerable light in
[157] their conditions of life. He has estimated the Onges as one of the happiest people of the world, who in spite of their primitive economy, are not the miserable victims of poor health, ill nutrition and oddities of life.

396 Some amount of artistry and craftsmanship have developed among these people. A canoe can be constructed by a man, all by himself from

[113] 1 Cipriani, L—Survey of Little Andaman during 1954; Bul. Dept. Anth.,

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2
ONG

the felling of the tree, chiselling the lumber and processing it further to give the shape of a canoe. Buckets of wood are also constructed by them from the softwood tree. Two types of baskets are made, the smaller ones are more well-finished than the bigger ones. The former is known as *tolcoaga* and the later *tole-laya*. Such activities have introduced the use of dahs, chisels, and iron files among the Onges, from the iron pieces derived from the sea shores. The other important pieces of their craftsmanship are the beautiful weavings of fibre, tussel of yellow fibre used by the women in their front. However, the art of making the earthen pots has been completely forgotten.

The leisure in their lives has helped the development of some amount of aesthetic senses among the Onges. All the Onges men and women shave their heads with flakes of glass, obtained from the sea-borne glass bottles. The body of the Onges are also painted with white clay which save their skin from insect-bite while red paint serves medicinal purposes if some individual is having fever. In times of mourning, red ochre paint is a taboo.[1]

Early marriage is the custom. The widows are looked down upon by the society. Some incidents of widow murder and drowning are heard. In the married life, the husband is devoted to his wife and both the husband and wife work for collecting their food.

Dances and songs are in vogue and there are practically songs for every occasion and activity. Most of their songs are more plaintive than joyous.

There are three broad divisions of the Onges of the Little Andaman :

(1) *Giremeka-Gobeule* group inhabiting the northeastern coast of the island ;

(2) *Engakwale group* live in the interior of the islands ; and

(3) *Gireraragobeule group* live in the southern and western coasts of the islands.

In spite of all the limitations, the Onges have been considered as one of the happiest people of the world with plenty of food and water to eat and drink and with very few social cankers to fight with. But as is common to all other aborigines of the Andamans, a decline in their number is discernible.

The Sentinelese

The Sentinelese are the least known of all the aborigines of the Anda-

1 The Onge of the Little Andaman—A short guide book ; Anthropological Gallery, Indian Museum, Calcutta.

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2
Negritos

mans. They live in the North Sentinel island and Portman had only made a few observations in the abandoned settlement of these aborigines. In 1886, Portman contacted a few Sentinelese with the help of a few Onges. The affinity of the Sentinelese with the Onges have been detected but the language of the Sentinelese is different from the Onges. However, only later researches can reveal more facts about their lives.

PRESENT DAY DISTRIBUTION OF THE ABORIGINAL POPULATION

The islands, though remained essentially a land of the aborigines, have a present day distribution which is very much discrete in nature. The nature of the distribution was very likely much more widespread in different parts of the islands but the great decline in their number coupled with gradual expansion of the area of the later settlers led to a continued recession of the aborigines in the more desolate areas. Thus there has been a great shrinkage in the territory of the aborigines of the South Andaman where no settlements of any importance had developed.

There are only a few Andamanese (23) who are still now surviving in the Middle and North Andamans and they live in the huts built up by the Forest Department.

The exact areas of inhabitation of the Jarawas are anybody's guess. Though the Jarawas have suffered a considerable decline in their number, no evidences of their distribution beyond the South Andaman are in view. Living under the cold patronage and hostility of the neighbours, the *Aka-beas*, a sub-group of the Andamanese, the Jarawas were always subjected to all their efforts of territorial expansion. Though their exact areas of distribution have not been traced so far, it is probable that they live in the dense forests of the South Andaman, especially in the least disturbed and unhaunted forest areas of the west. However, their biggest concentration is believed to be between Port Constance, Port Meadows and Shaol Bay.

The Sentinelese inhabit the North Sentinel Island and only further exploration in the island can furnish an idea about their exact spots of distribution.

The most predominant in number are the Onges who inhabit the island of Little Andaman. However they make occasional voyages to the Rutland and Cinque Island where some of them live. The areas of distribution of the Onges in Little Andaman are mainly in the coastal areas of the northeast, south and west and also in the interior.

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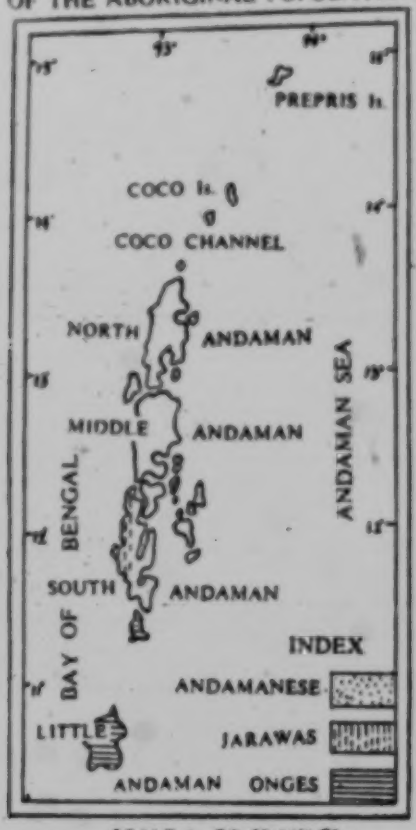
This speaks very well how in some isolated spots of the islands a remnant of the widespread negrito of the past stand on the verge of imminent decay.

AREAS OF DISTRIBUTION
OF THE ABORIGINAL POPULATION



SCALE 1 TO 70 MILES

DEMOGRAPHIC SET UP

A group of aborigines with their pristine culture in these isolated islands are sharing the same fate with many other aboriginal population of the world, of a considerable decline and impoverishment. It is be-

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yond doubt that the impact of the people having better material culture on the aboriginal population has resulted in an acceleration of their decay. The aborigines of the Great Andaman Group are the first people in the islands to come in contact with the later settlers and the early incorporation of many of the vices of these new comers have resulted in the furtherance of their decay. Such devastating effects are also observed in the case of many other aboriginal groups. The Red Indians of U.S.A. and the native population of Malanesia are only a few among the many others who are such victims of decline, more so immediately after the impact of the later settlers.

Whatever inadequate data are available about the number of aborigines and the other demographic characteristics, they show the nature of imbalance which stands in the way of their successful growth.

Table No. 1*

The aboriginal population.

Tribe	1858	1885	1901	1911	1921	1931	1941	1951
	100		39	36	17	7		
Karo	500		96	71	48	24		
Tabo	200		48	62	18	6		
Yeve	700		218	180	101	46		
Kede	500		39	34	6	2		
Juwai	300	2000	48	9	5	0		23
Koj	100		11	2	0	0		
Bojigyab	300		50	36	9	1		
Bea	500		37	19	1	0		
Belawa	300		19	15	4	2		
			625	464	209	88		23
Onge	700	1250	672	631	346	350		600
Jarawa	600		585	231	231	170		350
	4800	3250	1882	1326	786	608		973

In spite of the fact that the data of the aboriginal population, as given in the Table No. 1, is far from accurate, a very good idea of the nature of decline of the aboriginal population can be assessed. As is evident from the Table, the population of 4800 in 1858 has reduced to 608 in 1931 in less than 75 years.

* The figures are not at all accurate.

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The Andamanese are almost non-existent and at present only 23 are surviving. Sri Shivdasani writes,[1] "I met only 20 of them in the camp at Long Island and was surprised to see that the youngest child there was about 9 years old, possibly a half breed". This goes a long way to prove the extremely poor fertility of the Andamanese. This has been further substantiated by Dr. Sarkar on analysis of the reproductive capacities of 100 aboriginal women of the Andamans from the original data collected by Portman. 163

Table No. 2

Reproductive lives of the Andamanese Women.

	North Andamanese	South Andamanese
No. of women	50	50
Less married	4	1
	46	49
Unproductive marriages	21	17
	25	32
Average children per mother	2.86	2.81
Average living children per mother	0.92	0.38
Sex-ratio	39m:20f	52m:38f
Net reproductive index	0.36	0.16

Source. Sarkar, S. S.—The origin and migration of the Negritoes in the Andaman Islands, Man in India, Vol. 33, No. 4, Oct-Dec, 1953. [113]

As is evident from the above table, of the 100 women, 38 had unproductive marriages and 5 remained unmarried. The case of 43 women out of 100 can easily be set apart because of their unproductivity. This high percentage of unproductivity is really an alarming factor and the average number of children per mother is 2.83 but the average number of living children per mother is less. This ultimately results in a decline in the population number.

The Jarawa population, according to the 1951 census, is estimated in between 300 and 400. Further details about their demographic characteristics are not available. 162

1 Shivdasani, H. R. Report of the possibilities of colonisation and development of the Andaman & Nicobar Islands, 1949.

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Onge

162
114 The Onge population has been estimated by various authorities and the surveys of Dr. Cipriani have brought to light some important characteristics of the Onge population. Cipriani has ascertained the total Onge population to be 607, of which 229 are adult males, 241 are adult women and 137 children. Of the 137 children, he has detected 48 boys and 62 girls and about the rest he is not sure. However, the procedure followed by Cipriani and the conclusions derived by him, which are contrary to the previous knowledge, have been vehemently criticised by Dr. Sarkar.[1] Sarkar opines that the procedure of enumeration by counting the number of sleeping places in a communal hut is liable to gross errors because of the roving nature of the Onges of whom an appreciable number has no sleeping place. The determination of the sex-ratio from the communal huts are also more difficult. As a matter of fact the precision of enumeration, as is apparent from the census of Cipriani, cannot be attained and the deficiencies in the procedure of Cipriani have very well been brought to light by questioning and ultimate rejection by arguments. He writes that, 'His (Cipriani's) account is difficult to follow. There are very few relevant data regarding the actual Onge population. He has estimated the population instead of giving a simple population figure for each of the Onge settlements he visited. His estimates are based on the number of sleeping places in a hut, though nothing definite could be found either with regard to the total number of communal huts or the sleeping places. Then to find out the sex of the individuals from the sleeping places seems preposterous. Cipriani (1956) estimates the total Onge population to be 607, comprising 229 adult males, 241 adult women and 137 children. He was able to determine the sex of the children in about 80% of the cases, since immediately after the above quotation he states: 'Of the latter 48 are boys, 62 girls and of 27 sex could not be ascertained.' In the same paper and just two sentences before, where he gave the above figures, he mentioned a total of 497 individuals, comprising 242 men and 255 women. If the latter figures are meant only for adults then with the addition of 137 children to the above adult population of 497, the total Onge population appears to be 634. Even then the discrepancies in the adult population remain to be explained; it adds up to 470 (229 males, 241 females) once and to 497 (242 males, 255 females) another time.

Secondly, the enumeration of Cipriani shows a higher feminine population, whereas as analysed by Dr. Sarkar, all the previous estimates

[13]

1 Sarkar, S. S—Analecta et Additamenta, Anthropos 55, 1960.

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of the Onges actually seen, show a predominance of males. The determination of sex-ratio by Cipriani is no doubt very much speculative in nature and as is evident from the extract of the comment of Dr. Sarkar, Cipriani himself has been contrary to his own versions, at times. All the previous censuses of the actual Onges met and counted show a predominance of males and this happens to be the logical argument of Dr. Sarkar to conclude that the Onges population has been characterised by high masculinity. High masculinity always imply a very high predominance of males over females but never in the previous censuses we find such a high predominance. The census of Cipriani shows a slightly higher number of females than males and the attainment of such a slight predominance of females over males is never a physical impossibility. As such we may believe that there may be a slight predominance of females over males though the procedure adopted by Cipriani is by no means a precise one.

Dr. Sarkar, though apparently justified, totally rejects the procedure of Cipriani. Census of population is in itself a very difficult job and it is always liable to errors even in the advanced countries. Therefore, the enumeration of Dr. Cipriani is highly praiseworthy and because of the difficulties of contacting all the Onges the enumeration of the communal huts and the number of sleeping beds are no doubt very important clues for an intelligent guess about their number.

Though Dr. Sarkar pleads for the predominance of males by taking into account the number of Onges actually seen and counted (which show a predominance of males), the research expeditions undertaken by Sri R. C. Nigam[1] under the auspices of the Anthropological Survey of India in March, 1955 and December, 1956 made him fairly well-acquainted with the island of Little Andaman. From his own actual counting, a higher number of females have been counted than males. He was able to contact 161 Onge individuals of which 138 belonged to the 45 family units and the rest were 'unattached'[2] individuals i.e., widows, unmarried

1 Nigam, R. C.—Little known tribes of the Andaman Islands—Their problems and prospect; Vanyajati; Vol. VIII, January, 1960, No. 1; Vol. VIII, April, 1960, No. 2 and Vol. VIII, July, 1960, No. 3.

2 A family is considered to be comprised of parents and children whereas, if the father or mother of a family is dead, the members have been called as 'unattached' type by R. C. Nigam.

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boys and girls and children of the widows. The break-up of the total population is given below.

Table No 3

	Male	Female
Adult	46	61
Child	30	24
	76	85

On the consideration of the total population, there is a 5.6% excess of the female population over the male population.

However, the further break-up of the total number of Onges counted by Sri Nigam reveals some of the most important demographic characteristics of the Onge population. Considering only the 45 family units, it is found that there is a preponderance of males over the females as is evident from the table below.

Table No 4

	Individuals			Children		
No. of families	Male	Female	Total	Male	Female	Total
45	75	67	138	26	22	48

The Onge of the 'unattached' type, therefore, are comprised of 5 males and 18 females. Of this 10 are widows. So the predominance of the females among the Onges may be due to a higher percentage of widows whereas the widowers are much less in number. This throws another important light on the logevity of the Onge males and females. The females, as it stands, have a longer life than males and this is not only a very important aspect of the Onge population but also of the other tribes of the world. In Africa also such a higher longevity of the females is discernible which is due, as is commonly believed to higher resistive power of the females to fight the odds of life compared to the males.

The fertility of the adult females are also extremely poor. He writes[1] in 'the total of 61 adult females there were 10 widows who were too old for child-bearing, 4 married women with their child-bearing period finished, while there were 8 married women with no possibility of any issue. Thus

1 Nigam, R. C.—Little known tribes of the Andaman Islands—Their problems & prospects; Vanyajati, Vol. VIII, July, 1960. No. 3.

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In the sample of 61 adult females, 22 women were nonfecund. As such the obvious female preponderance in the total sample is not of much value and the total picture of Onge population is rather that of decline only.' Such a decline of the fertility of the Andamanese women has already been pointed out.

Of all the aboriginal population, the Onges are to-day the most widespread and have undoubtedly a very balanced sex-ratio. As regards the fertility, there is a gradual unproductiveness amongst all the aboriginal population. The Andamanese who are on the last legs of the decay have the youngest child of more than 10 years. Nothing definite can be said about the Jarawas and the Sentinelese but they are also on the verge of their decay.

PROBLEMS OF THE ABORIGINES

Assessment of the socio-economic and cultural problems is always subjective and a true assessment is only possible through the first-hand intimate acquaintance of the aborigines. The aboriginal population of the world to-day present a very gloomy picture of stagnation or decay and the aboriginal population of the Andamans are undoubtedly sharing this dismal fate of decay.

Only after the impact of the people having better material attainments the problems of the aborigines have been aggravated that paved the path of total ruination of their socio-economic traits and also initiated their gradual numerical decay. Such evidences of decay only in the last few centuries are within view in the case of the American Indians which formerly having 268 groups have dwindled to only 67 groups now surviving when the rest have been wiped out. The case of the aboriginal population of Australia, Tasmania, Malanesian Islands and the others of southeast Asia present such a gloomy picture. The causes of such a decline have been attributed to the incorporation of vices and such social poisons as alcohol and opium, attack of venereal diseases, quick adoption of foreign customs and modes of life which have been proved incongenial in their own environmental context and also to the gradual 'loss of interest in life.' This loss of interest in life, according to Rivers[1] takes away from the people the desire to live and to shoulder the burden of life, with the result that mortality incidence goes high and the more obvious causes of mortality like new diseases, the social poisons etc, tend to have greater potency for

1 Rivers, W. H. R—Essays on the depopulation of Malanesia (Ed). 1922.

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2

161 177 evil and are allowed to work such ravages upon life and health of people whose resistance level has already gone quite low.[2] Such a loss of interest in life is common to many of the aboriginal population. The aboriginal population of the Andamans have also been victimised to it and only in one century the aborigines of the Great Andaman Group have almost been wiped out and the Jarawas, in spite of their isolation, have been undergoing considerable decay. The Onges are also suffering, from stagnation and decay. There has been the addiction to some of the social poisons e.g. tobacco, alcohol, etc.

The causes of decay of the aboriginal population of the Andamans may be summed up as being the followings:

1. Diseases;
2. Murder of the aborigines by the later settlers, especially the bombardment of the Japanese in the Jarawa infested areas have resulted in a virtual decline of the tribe;
3. Little productive capacity of the aboriginal women.

The sex-ratio in the case of the Onges is quite balanced and therefore, the sex-ratio is not a factor for the decline of the aboriginal population but very little productive capacity of the aboriginal population is undoubtedly a major factor of their decline and it has already been discussed.

178 As regards the material life, however satisfied the aboriginal population may be with their poor lot, it is in most primitive form and the only materials that they have in possession are for earning their livelihood. Cultural aspect is also desiccated with a dearth of richness. No evolution has, however, been observed for deriving much more material comforts and the aborigines with their hard struggle for life hardly find any time to develop their thinking which can lead to a betterment of their cultural and material life.

THE FUTURE

185 000 These aboriginal population have so far shown little urge for improving their own lot and in the absence of such attempts, the chances of their betterment as well as survival is a far cry. The only means of improving their lot seems to be possible through the efforts of the Government. The attempts for bringing the aborigines in a short period within the folds of an advanced economy and society have proved futile and contrary to it, the attempts of segregating the aboriginal population, as done in the

2 Nigam, R. C.—Little known tribes of the Andaman Islands—Their problems & prospects; Vol. VIII, April, 1960. No. 2.

10: Sen K-3, 4 (ca. 1955) 1962 AZ2 Andamans AZ2

United States with the idea of giving them a free opportunity of developing their own lot through their own efforts, have also proved equally unsuccessful. How best the lot of the aborigines can be improved remains a great question. Only a careful first hand knowledge may lead to the understanding of their problems. The problems of improving these aborigines can be attained by a two-fold solution—by the development of their material lives and by changing their outlook of life. The ultimate objective is to bring about more of amenities and happiness in their lives and chances were not few when with the attempts for attaining such an objective the consequences have been only painful.

With the inadequate knowledge that has been gathered about the aborigines of the Andamans, an assessment of their problems will be far from satisfactory unless a better knowledge of their language, socio-economic and psychological traits are acquired.

The material life is obviously very poor. Their energy is spent only after the earning of their food. With the hunting and collecting type of economy, the availability of foodstuffs is always scarce and also extremely perilous. The Onges who have been estimated by Cipriani as one of the happiest people on the earth also suffer from a considerable scarcity of foodstuffs during the summer. A few very helpful practical suggestions have been offered by Sri R. C. Nigam for supplementing the shortage of their foodstuffs. This is by introducing agriculture in this region. He has offered two plans.

1. A long term plan and
2. A short term plan.

In the long term plan, he envisages the introduction of a number of plantation crops e.g. cocoanuts, papaya, pandanus and jackfruit. Such a plantation of cocoanuts have been established in the Dugong Creek area of the Little Andaman by the Andaman Administration. Sri Nigam has pointed out 5 other areas where such plantations can be developed in the future and all these 5 spots are sufficiently close to the settlement of the Onges e.g. Togalbnge, Cheruger, Entigue in the interior of the island, Otidubara in the south coast and Koname in the west coast of the island. The fruits of the plantations will be available after about 8 years.

The short term plan on the other hand is for implementing immediate improvement of the food conditions which can be achieved by the introduction of Nocobarese yam, sweet potatoes, tapioca and such other tuberous plants all over the island.

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These plans seek the introduction of agriculture among these people which can be possible only by imparting a gradual knowledge of tilling and culturing the soils to them.

Simultaneously with it the introduction of some deer in the islands and in course of time, domestication of animals like pigs, goats and poultry farming have been suggested. These are no doubt very helpful suggestions but such a change in their economy can be feasible if there is a gradual urge among these people for changing their own primitive economy. Nigam says that within 15 years such an economy may very well find a footing.

For changing the outlook of these people, attempts should be made gradually for developing an intimate knowledge about them which can only be achieved well by learning their language.

For the prevention & cure of disease medical facilities must be made available and proper steps should be taken so that addiction to the social poision does not increase.

The Jarawas, though show conspicuous signs of decline, are still now of considerable number. The attempts for establishing friendly relations with them have so far proved futile. Presents are given by the Government in their settlements, of course, in their absence, as the direct encounter with them may prove fatal. Nevertheless the means of bringing them closer may be sought in the same way as Portman did in the case of the Onges who were captivated, while stranded, in the island only by chance. If a group of Jarawas could be captivated and given the best of understanding of friendship and amity, this may lead to further understanding of these people.

The little knowledge about the Sentinelese precludes any comment about their future unless attempts for landing in the island and subsequent researches about these aborigines are made.

The future of the Andamanese can hardly be of any consideration as they are the last few (23) of the big decaying family of the Great Andaman Group of aborigines.

[pp. 77-197 not Processed]

/For an analysis of the geology of the Andaman-Nicobar ridge area upon which both chains of islands lie, see 10: Sen, AZ2 Andamans, category 116, pp. 11-19./